

THE Soybean Digest

REG. U. S. PAT. OFF.

GEO. M. STRAYER, Editor

KENT PELLETT, Managing Editor

Publishers' Representatives: Ewing Hutchison Co., Chicago

Vol. 7

DECEMBER ☆ 1946

No. 2

Published on the 15th of each month at Hudson, Iowa, by the American Soybean Association. Entered as second class matter November 20, 1940, at the postoffice at Hudson, Iowa, under the Act of March 3, 1879. Forms close on 1st of month. Subscription price to association members, \$1.50 per year; to non-members, \$2.00 per year; Canada and other members of the Pan-American Union, \$2.50; other foreign, \$3.00.

IN THIS ISSUE

	Page
Editor's Desk	5
World Soybean Production Up	9
Missouri's Golden Harvest	10
Varieties for the South	11
L. M. HUMPHREY	
Breeding Soybeans for Holland	13
L. KOCH	
Proteins as Industrial Raw Materials	14
A. K. SMITH	
Paul R. Henson	20
Defends Earlyana	21
Solvent Process for Cottonseed	21
Ford Drops Soybean Operations	21
Soy in Quantity Cookery	22
Publications	26
Grits and Flakes	28
Whip Topping New Product	31
Washington Digest	32
PORTER M. HEDGE	
Soy Oil on New York Exchange	33
1946 Soybean Yield	34
Germans Made Butter From Coal	34
Markets and Orders	36

THE AMERICAN SOYBEAN ASSOCIATION

OFFICERS: President, Walter W. McLaughlin, Decatur, Ill.; Vice President, J. B. Edmondson, Clayton, Ind.; Secretary-treasurer, Geo. M. Strayer, Hudson, Iowa.

DIRECTORS: Jacob Hartz, Stuttgart, Ark.; Walter W. McLaughlin, Decatur, Ill.; Frank S. Garwood, Stonington, Ill.; J. B. Edmondson, Clayton, Ind.; Ersel Walley, Fort Wayne, Ind.; Geo. M. Strayer, Hudson, Iowa; Howard L. Roach, Plainfield, Iowa; John W. Evans, Montevideo, Minn.; Harry A. Plattner, Malta Bend, Mo.; L. S. Stoner, Holly Bluff, Miss.; G. G. McIlroy, Irwin, Ohio; W. G. Weigle, Van Wert, Ohio; and John Dries, Saukville, Wis.

THE FACT STILL
REMAINS THAT
SUPERIOR ELEVATOR
CUPS

"DP" - "OK" - "CC" - "V"
are MADE STRONGER
will LAST LONGER

have

GREATER CAPACITY

and will operate more efficiently at less cost than
other elevator cups.

write to

K. I. WILLIS CORPORATION
MOLINE, ILLINOIS

for names of distributors and analysis form No. 20



A. E. BURGESS

BROKER

401-03 United Gas Building
Houston, Texas

SOY OIL AND MEAL
COTTONSEED OIL AND MEAL

HOUSTON, TEXAS

WHERE PRICES PAID ARE HIGHEST

I Solicit Your Accounts

Phones LD 371 and 756 Local P 1054

Puritan Manufacturing Co.

SPECIALIZED MILLING SERVICE

for

Soya Beans — Flour — Feed

Roll Grinding and Corrugating

Leather-Rubber-Cotton Belting

Chain and "V" Belt Drives

Cyclone Metal Dust Collectors

Gears cut to order (Midwests' only
gear cutting Plant)

LET US DO YOUR ROLL WORK

Latest style cuts

Prompt Service

1931 North 11th Street

Omaha

Nebraska



DUAL DEPTH CONTROL

Follows the Contour of the Ground

Handy dual control levers gauge the exact depth of right and left gangs independently. Even on terraces, back furrows or dead furrows, you can place seed and fertilizer at the desired depth.

Cornbelt colleges and experiment stations predict a new and better crop growing system, based on contour tillage. Advance U. S. Soil Conservation Service reports indicate a national average yield increase of 11 per cent to date for contour-cultivated corn.

Allis-Chalmers **FRONT-MOUNTED** implements with **DUAL DEPTH CONTROL** make contouring a real possibility for the average farm. A planter and cultivator mounted *ahead* of the driver's seat make it easy to follow a curved row.

Seed and fertilizer can be placed at precise depth, in contour rows that catch and hold moisture on the slope. Rotary hoe cultivator attachments roll directly over the row, lifting out weeds. Fewer young crop plants damaged by cultivator shovels mean a higher stalk population per acre.

These are methods recognized as setting a major new trend in agriculture. Allis-Chalmers "looks ahead" to better living for every family farm.



EDITOR'S DESK

Committed to American Oils

Representatives of the cotton industry and the soybean industry recently met with the margarine manufacturers in Chicago to discuss the raw material supply situation. Caught between an increased demand for their product and a decreased supply of edible domestic fats, the margarine manufacturers are faced with possible shut-downs — or the use of imported fats and oils.

There was an unanimous expression from margarine manufacturers that they had no intention of using foreign oil in their products. There were repeated vows that they would lock up their plants before they would resort to the coconut cow. There seemed to be no question about it — domestically produced oils are now assured of the margarine market.

Over a period of several years an increasing number of margarine manufacturers have been basing their sales campaigns, their advertising and their legislative campaigns on the fact that they use the products of American farms exclusively. Contrary to the contentions of many of them a decade ago, their products have improved in their quality level, rather than deteriorating. Domestic oils have proven to be more uniform, of higher quality, easier to handle. Today's margarine is a vastly superior product to that of the 30's. The margarine manufacturers themselves make that contention.

Margarine manufacturers in 1945 used over 206 million pounds of domestic soybean oil. This is the production of nearly 1.5 million acres — or 15 percent of all soybean oil produced. The 1946 figure would be bigger — if the soybean oil were available. Margarine is a major market for the soybean grower. For years the AMERICAN SOYBEAN ASSOCIATION has asked the margarine industry to commit itself to the use of domestic oils exclusively. It did so last summer.

To resort to the use of foreign oils in margarine now would destroy the gradual accumulation of good will which has been building up over a period of years. American margarine — made from American farm products — will find its market levels without restrictive taxation within the next decade.

Where Our Beans Go

THE AVERAGE AMERICAN FARMER HAS GIVEN LITTLE THOUGHT TO THE USAGES OF THE SOYBEAN OIL WHICH HE PRODUCES. He knows where the soybean oil meal goes—for he uses it in his feeding operations. He knows he eats some of it in grocery products.

BUT SOYBEAN OIL LOSES ITS IDENTITY when he sells the crop, and very few farmers know where it goes. In a recent survey less than 5 percent of the soybean growers interviewed had ever heard that margarine was being made from soybean oil. Fully 80 percent of the growers

of soybeans, scattered through four states, were surprised to learn that soybean oil was going into margarine.

We will venture a guess that not more than 5 percent of the producers of soybean oil know that over 683 million pounds of soybean oil were used in the production of vegetable shortenings last year. And we'll venture a further guess that less than 5 percent of the men who are producing soybeans know that over two-thirds of all the soybean oil produced in the United States last year was used in shortenings, margarine and salad oils!

As producers of the soybean crop we must create an awareness on the part of our fellow growers of the end usage of our products, and of the necessity of using those products ourselves and sponsoring their use by others. The war is over, the after-effects are with us, and one of our big jobs is the educational responsibility for building for soybeans a sound and permanent market. We first must educate ourselves!

Leadership Has Shifted

The complexion of Congress changed with the November elections. A change in majority party means new programs, new ideas, new leadership. Committee membership will change, and the farm programs may likewise change. There are, however, certain definite commitments such as the Steagall amendment, which must remain in effect. Unless the end of the war is declared officially to have arrived previous to January 1, which seems unlikely, the prices of certain crops must remain at 90 percent of parity through 1949.

The responsibility for leadership has also shifted to another section of the country. From the South the leadership in agriculture has swung back to the Midwest, where the major portion of the soybeans are grown.

Leadership in any fats and oils legislation during the next 2 years, will of necessity, come out of this same Midwest area. For the first time in over a decade the ball has been passed into our hands, and with it has come the responsibility of carrying it.

On the growers of soybeans, their representatives in Congress, and the AMERICAN SOYBEAN ASSOCIATION now falls the task of maintaining and protecting the gains which soybean, cotton and peanut growers have made during the war years. We will have assistance from the other groups — but the responsibility for leadership is definitely ours. DO YOUR CONGRESSIONAL REPRESENTATIVES KNOW THE IMPORTANCE OF THE SOYBEAN INCOME TO THEIR DISTRICTS? They are at home now—and THIS IS A GOOD TIME TO TELL THEM THAT STORY.

Just in Passing . . .

There are still rumbles at the beating of soybean ceilings by the government. This is water over the dam as that particular fiasco is not apt to be repeated . . . Advance advertising sales for the *Soybean Blue Book* to be published in March are exceeding expectations.

GREETINGS

To our many friends throughout the soybean industry the staff of the SOYBEAN DIGEST takes this opportunity to extend the most sincere of Holiday Greetings. We are grateful for your guidance, assistance and suggestions throughout the past year. We look forward to their continuation. We trust that the NEW YEAR will usher in another 52 weeks of successful operations for you, and that you can now look back over 1946 with the satisfaction of a job well done.



**ONLY 1 MINUTE
TO MAKE A TEST!**

with a
Steinlite

MOISTURE TESTER

Speed is an important factor in moisture testing . . . and the Steinlite moisture tester is fast. An experienced operator can make a test in one minute—almost any operator in 2 or 3 minutes. It tests a wide variety of products—whole grain, seeds, mixed feeds, meal, cottonseed, nuts, popcorn, etc. New applications are being found regularly.

WILL PAY FOR ITSELF

Steinlite will pay for itself in the average plant in one season when a high moisture crop is being handled.

EASY TO OPERATE AS A RADIO

Steinlite operates on the radio frequency impedance principle. Calibrated against official oven methods and guaranteed to give comparable results. It is accurate for all practical purposes on moisture contents up to 35%. No technical knowledge is required, and no previous experience.

FULLY GUARANTEED

Steinlite is fully guaranteed for one year. The only parts likely to require replacement are inexpensive radio tubes which ordinarily last longer than a year.

FREE TRIAL OFFER

Steinlite is sold on a ten day free trial basis to enable you to check it thoroughly and prove its worth in your own business. Take advantage of this offer.

IT'S EASY TO MAKE A TEST

1. Turn on switch, adjust needle on meter dial.
2. Weigh out an accurate sample.
3. Pour sample into hopper.
4. Read meter dial.
5. Compare reading with conversion chart showing percentage of moisture.

OVER 8,500 IN USE

There are more Steinlites in operation than all other makes of electric testers combined. Over 8,500 elevators, mills and feed processing plants are equipped with the Steinlite. It is used by Board of Trade Sampling Departments, and also Government Grain Inspection Offices.

"BUYING CENTER"

For Equipment and Supplies

Seedburo's line includes over 500 different items—thermometers, bag trucks, scales, intercommunication systems, fire extinguishers, insecticides and a host of other products. All are described and illustrated in the Seedburo Catalog and Reference Book. If you have not received your copy—write today.

SEEDBURO
EQUIPMENT COMPANY

629 BROOKS BUILDING • CHICAGO 6, ILLINOIS

SOYBEAN DIGEST

Read the facts
and
judge for yourself



rite for free copies of any
ase history, or for a com-
plete set. They describe what
was wrong with the "old
system" and how a St. Regis
Packaging System brought
outstanding economies.

Case History	Product Packed	Increase in Packaging Output (Hourly)	Total Savings in Packaging Costs
No. 1	Flour Mix	100%	77%
No. 2	Fertilizer	20%	47%
No. 3	Poultry Grit	100%	55%
No. 4	Salt	18%	45%
No. 5	Cocoa	62%	60%
No. 6	Barley	—*	62%
No. 7	Dog Food	100%	34%
No. 8	Fuller's Earth	180%	24%
No. 9	Talc	100%	35%
No. 10	Fertilizer	38%	26%

*Previous figures not available

Without obligation please send me
orders describing case histories indicated:

1 No. 2 No. 3 No. 4 No. 5
6 No. 7 No. 8 No. 9 No. 10

ME

MPANY

DRESS

DECEMBER, 1946

WORLD SOYBEAN PRODUCTION UP

Preliminary estimates for the major soybean producing countries place the 1946 world production at 534.3 million bushels, compared with 543.2 million in 1945 and a 5-year (1935-39) average of 459.8 million, reports USDA'S *Foreign Crops and Markets*. This rise above the prewar level was due largely to increased production in the United States and Canada.

During the 1935-39 period, the volume of soybean production was concentrated in Asia. The European crops were insignificant by comparison but played an important role during the Hitler regime. Soybean-acreage expansion in the United States was one of the outstanding war efforts production rose from 77 million in 1940 to 193 million bushels in 1943 and remains at approximately that figure. Canada also became a wartime producer with an estimated crop of more than a million bushels for the current season.

PRODUCTION IN CHINA

China's (excluding Manchuria's) 1946 production of 203 million bushels, though slightly smaller than the 1935-39 average, exceeds the crops of recent years and is the largest since the 1940 harvest of 216.8 million bushels. Production declined during the war years chiefly because of Japanese occupation of the principal growing areas and a shortage of labor and draft power.

Although China is normally the world's greatest soybean producer, relatively small quantities have been exported, and in some years since 1931 that country has been a

net importer, obtaining small quantities of both beans and oil from Manchuria.

China's domestic consumption consists primarily of soybeans for human food. About one-fourth of the annual production is crushed for oil, 10 percent is used for feed, and 8 percent is required for planting.

MANCHURIA

While an official estimate is not available, indications are that Manchuria's 1946 crop is less than two-thirds of the 1935-39 average of 151.3 million bushels. Until 1942, Manchuria ranked second in importance as a soybean producer having almost a complete monopoly of world exports of both seed and oil. During 1935-39 shipments of seed and oil in terms of seed accounted for approximately 80 percent of the total entering world trade.

The United States forecast for 1946 soybeans is 192 million bushels, second only to the record of 193 million in 1943. Beginning with 1942, the United States became an outstanding producer of soybeans. From the 1935-39 average of 56 million bushels, production rose to 187 million in 1942 and has shown marked stability since that time.

This country became a net exporter of soybeans during the 1931-32 season (October-September), when total shipments were about 2 million bushels. In 1939-40 net exports of beans and oil in terms of beans amounted to more than 12 million bushels, and in 1945 the quantity was approximately the same.

SOYBEANS: Acreage, yield per acre, and production in specified countries, average 1935-39, annual 1943-46

Country	Acreage (1,000)			Production (1,000 Bu.)		
	Average 1935-39	1945 a/	1946 a/	Average 1935-39	1945 a/	1946 a/
China b/	12,411	11,912	11,957	207,666	197,580	203,025
Manchuria	8,992			151,294		
United States c/	3,042	10,873	9,477	56,167	191,722	191,912
Canada	d/ 10	44	54	207	832	1,063
Korea	d/ 1,921			17,654		
Japan	d/ 812			12,499	12,456	13,228
Formosa	d/ 17			151		
Netherland Indies	889			9,731		
Rumania	161			1,869		
Bulgaria e/	29	16 f/	37	364	80 f/	187
Yugoslavia	5			71		
Hungary	g/ 7	6	6 g/	125	48	59
Estimated world total excluding the Soviet Union h/	28,600	33,600	31,400	459,800	543,200	534,300

Office of Foreign Agricultural Relations. Compiled from official sources or estimate from foreign service report and other information.

a/ Preliminary.

b/ Partly estimated.

c/ Acreage harvested for beans

d/ Average of less than 5 years.

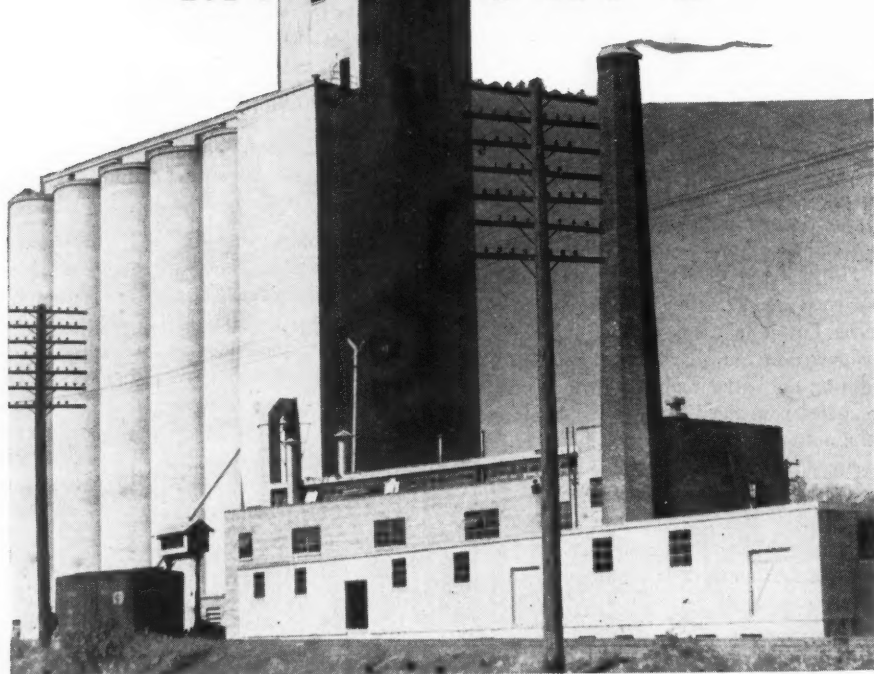
e/ Beginning with 1943, figures include Southern Dobrudja.

f/ Office estimate.

g/ One year only.

h/ Includes estimates for the above countries for which data are not available and for minor producing countries.

MISSOURI'S



—Courtesy Missouri Ruralist

The 300,000 bu. storage bins of Missouri Farmers' Association at Mexico are bulging with soybeans.

GOLDEN HARVEST

- *Soybeans in Missouri are surprising even their best friends. In the northeast it is not unusual for one crop to pay for the land it is grown on. On the southeast bottoms soybeans are a valuable addition to cotton.*

THE STATE of Missouri registered another big increase in soybean production this year.

The crop may have receded somewhat in the big four of soybean production—Illinois, Iowa, Indiana and Ohio. But two other leading soybean states, Minnesota and Missouri, have just hit boom stride.

Minnesota production zoomed from 6.8 to 10.5 million bushels in 1946, an increase in 1 year of 54 percent. Missouri's production was 12.3 million bushels compared with 9.5 last year, an increase of 30 percent. These figures are from the November crop report of the U. S. Department of Agriculture.

The most astonishing aspect of the Missouri crop was the state average yield, which was 19 bushels. This was exceeded by only two states in the union, Illinois and Iowa. Yet Missouri's past 10-year average yield stood at 12.2, only a fraction of the average of the leading Corn-belt states!

Down on the southeast Missouri bottoms yields of 45 and 55 bushels were reported this year. Such yields are fabulous any place, any year.

The big bean sections of Missouri—the rolling clay lands of the northeast and the flat bottoms of the southeast—during harvest resembled nothing so much as a vast beehive at swarming time.

Cordell Tindell in *Missouri Ruralist* describes it: "There is always an air of excitement readily felt in a section busy harvesting a big-money crop. We've seen it in the cotton countries. We have felt it around the apple sheds. There's a feverish haste to market such perishable crops as strawberries. Years ago there was excitement in hauling the wheat crop to elevators, but this scene has changed in Missouri.

"Well the harvest of the golden crop of soybeans was all these rolled into one. The weatherman set the stage. In the last weeks of September and early October

there was scarcely a cloud to threaten the perfect harvest weather. Beans ripened overnight, and combines scurried to the fields to beat the fall rains.

"Beans poured in by truck, by trailer, by wagon, even in sacks in autos. Small country elevators filled their bins at once, wired frantically for freight cars. The elevators served only to buy and weigh the beans."

There had been some question of whether the Missouri Farmers Association could find enough beans to fill its recently completed 300,000 bushel capacity bins at Mexico. But they were filled in a matter of days.

LAND NOT THE BEST

"Most remarkable about the bumper crop of soybeans in northeast Missouri is the fact that the beans are being produced on land often considered unproductive," commented Tindell. "On some land, average yields of 20 bushels of soybeans to the acre would come as no surprise. But on land that does well to make 20 bushels of corn to the acre, such a county average (estimated in Audrain County this year) is difficult to explain.

"We have no desire to start a land boom in northeast Missouri. But here is what is happening on hundreds of farms. Land that sold for \$35 to \$50 an acre is producing 20 to 25 bushels of beans to the acre. Thus, it is commonplace for the return from one crop of beans to pay the cost of the land."

But if beans are booming on the gray prairies of northeast Missouri, production is even greater down on the cotton lands of the state's southeast tip. Here six counties—Dunklin, Mississippi, New Madrid, Pemiscot, Scott and Stoddard—produced over half the state's soybeans this year. These counties averaged well over a million bushels.

This region, which prides itself on growing more short staple cotton per acre than any similar area in the U. S., realized 20 million dollars from its soybeans in 1946. (This heavy producing section carries over into Arkansas. Mississippi County, Ark., just south of Dunklin and Pemiscot, is one of the nation's big soybean counties.)

At Ristine, in the heart of this area. Southeast Missouri Oil Mill, Inc., is completing a big new solvent processing outfit to operate on 1946 crop beans. It has a capacity of 1 million bushels a year. Its storage bins will hold 750,000 bushels.

"It is quite likely that it will be some considerable time before the high yield and high prices of the 1946 soybean crop will be forgotten in southeast Missouri," says E. L. Corbin in the *Sikeston Herald*.

As a cash crop soybeans are now exceeded only by wheat and cotton in Missouri. What are the reasons for a rise

in soybean production that has astonished even the most enthusiastic soybeaners? There are a number, one of which has been a series of good crop years.

Prior to the war over two-thirds of the soybeans were grown for forage or hay. When farmers learned that they would grow under more adverse soil conditions than other legumes and produce hay, they looked on them as a poor land crop. This was an error not confined to Missouri.

The first lesson that had to be learned was that seed beans cannot be grown without soil fertility.

In northeast Missouri growers attribute much of the shift from 10 to 20 bushel crops to an extensive liming program stimulated by AAA payments a few years ago. There is also a greatly increased use of fertilizer in this section. Much stress is placed on "balanced farming." It has been the undergirding of soybeans by limestone and fertilizers that has pushed them up into the cash crop class, says A. W. Klemme, extension professor of soils at the University of Missouri.

YIELD CONTESTS

The yield contests sponsored by the University's extension service and the Alton Railroad the past several years have also had their effect. This program, in addition to stressing the soil treatments and soil conserving practices, has urged use of adapted varieties, inoculation and proper culture. Interest in the yield contests has been widespread and has served to focus attention on the practices that have bettered yields.

A popular rotation in northeast Missouri is corn, soybeans, fall-seeded small grain—usually wheat—and sweet clover. But the corn is being left out more and more, making a short, 2-year rotation. This accords with the recommendations of the Missouri extension service that soybeans follow a solid planted crop rather than corn, as an erosion control measure.

Down on the southeast Missouri bottoms there is a different reason for the current enthusiasm for soybeans. It is the illness of King Cotton.

Says the *Sikeston Herald*: "Soybeans are not necessarily supplanting cotton, but they are proving to be a most valuable staff on which to lean when King Cotton is ill—as is attested this year by innumerable farmers and landowners within driving distance of Sikeston. The continued solvency of some operators in the wake of two seasons particularly unfavorable for cotton is ample evidence that soybeans have a definite place in southeast Missouri agriculture, for in many cases soybeans alone provided the means to meet operating expenses and lighten the mortgage on the old homestead."

During the past two seasons the weather was wet at cotton planting time on the



—Missouri Ruralist Photo
Carver Brown, Laddonia, Mo., examines a field of Macoupins that will make 20 bushels to the acre.

delta lands. Many cotton stands had to be abandoned on overflowed land. The earlier maturing soys were a godsend since the soil dried out in time for them to mature a crop. They meant a crop in many cases where otherwise there would have been none.

Like agriculture in general, the Missouri cotton country is afflicted with a labor shortage. Cotton is still primarily a hand crop. Cheap labor used to be plentiful, but it is no longer either plentiful or cheap. Soybeans are adapted to

power farming. Ten acres of soys can be produced with the same labor as 1 acre of cotton. The introduction of beans into this region as elsewhere has kept pace with the growing use of the combine. Another factor is soybean varieties that will mature in advance of cotton. This enables the soybeans to be harvested ahead of cotton picking time.

It is being learned that the production of soys is increasing the yield of the cotton crops following. Farmers are learning the intelligent use of fertilizer, which helps to produce the big crops of beans, and also benefits the cotton.

* * *

There is not the intense competition with corn in Missouri that is found in the higher corn producing regions. On land which grows as many bushels of beans as corn, the soys do not suffer by comparing the income from the two crops.

VARIETIES GROWN

Adapted varieties are being stressed and are having their effect on yields. Missouri extension service recommends Chiefs for the whole state except the southeast bottom country. Lincoln is recommended for the north three-fourths of the state, Boone for the southern three-fourths.

In the southeast there are more Ralsoys than all other varieties put together. Developed by Heartsill Banks, Ral soy is a high yielding, readily combined variety adapted to this region and also to north-eastern Arkansas and western Tennessee. But a considerable acreage of the older Arksoy is also still being grown.

There is interest in S-100, not yet named or offered for certification. This variety was developed under the direction of B. M. King at the Sikeston Experiment Station. It is 20 to 25 days earlier than Ral soy.

New High Yielding Soybean Varieties for the South

By L. M. HUMPHREY

Plant Breeder, Robert L. Dortch Seed Farms, Scott, Ark.

Two objections have been raised by Southern farmers to raising soybeans. These objections are; they don't yield enough to compete with cotton and they shatter so badly that field loss greatly reduces yields. Efforts are being made in our soybean breeding program to correct these and other undesirable characteristics.

The accompanying table contains data obtained from a variety test conducted on one of the plantations of the Robert L.

Dortch Seed Farms at Scott, Ark. These data indicate that progress is being made particularly in increasing the yield and also in producing a high degree of shatter resistance.

This variety test was conducted on fine Sandy Loam Arkansas River bottom soil of a little better than average fertility. Ph was 6.8 and 300 pounds of 3-9-18 fertilizer was broadcast on the land before plowing. For the purpose of studying individual plant behavior, the test was hand planted in hills 22 inches apart and thinned to one plant per hill. Rows were 60 feet long and five randomized replications

were used. At harvesting time, plants were cut by hand and threshed on a small thresher powered by a 3 h. p. gas engine.

Yields may appear to be somewhat higher than might normally be expected. This is caused by two things. First, all the beans are harvested which is not usually the case with the combine. Second, the widely spaced plants yield somewhat more than they do planted thick. These yields, however, are comparative.

RANGE OF VARIETIES

Early Varieties: These might be divided into two groups; Macoupin, Hongkong and S-100 which matured in 123 days, and very early varieties, Patoka, Purdue 7, Illini, Richland and Lincoln which matured in 110-119 days. The very early varieties do not yield very well, though Purdue 7 and Patoka performed as well as Macoupin. S-100, which had all the plant and grain characteristics of Macoupin, out-yielded Macoupin by a significant amount, and would seem to be a considerable improvement over Macoupin.

Mid-Season Varieties: These varieties matured in from 132 to 144 days. These included the Dortchsoy varieties Nos. 2, 7, 15, 28, 29, 30, 33, 35 and 38, Ral soy, the Ogden s, the Burdette varieties 13 and 19. Several of these varieties yielded well, but a high degree of shatter resistance was observed only in Dortchsoy Nos. 7, 33, 29 and 28 among the highest yielding varieties. Dortchsoy No. 7 showed no shattering during the first 30 days following maturity. Dortchsoy No. 2 showed good shatter resistance with about 7 percent after 30 days. The accompanying photograph illustrates typical midsummer growth of Dortchsoy No. 2.

Late Varieties: These varieties should perhaps be divided into two groups, medium late with maturity from 150-162 days, and very late with maturity of 170 days and later. The varieties falling into the earlier group are: The Dortchsoy varieties Nos. 16, 31, 34, 36 and 37, Volstate, Roanoke, Burdette 20 and 30967W. Of these, the better yielders are Dortchsoy 31, 37 and 16, Volstate and Roanoke. All of these varieties at present indicate good to excellent shatter resistance. The very late varieties included Mamloxi, Mamotan, 54618, Pellican and Acadian. All of these mature too late to be considered well adapted to this part of Arkansas.

Soybeans are not only here to stay, they have become one of America's major crops. It is the job of the plant breeder to keep abreast of the times with high yielding adapted varieties that can meet the competition of other crops. Our efforts are being directed toward this end, and the progress made thus far may be judged by the above results.



Field of Dortchsoy No. 2 showing typical midsummer growth.



Soybean Variety Test 1946, Robert L. Dortch Seed Farms, Scott, Ark.

Rank	Variety	Yield Bu. Per Acre	Days to Maturity	At Maturity	Shattering Percent		Plant Height
					After 15 Days	After 30 Days	
1	Dortchsoy No. 2	52.1	144	None	3%	7%	Med.
2	Dortchsoy No. 31	52.0	162	None	None	—	Med.
3	*Dortchsoy No. 37	51.1	162	None	None	—	Med.
4	Volstate	50.2	163	None	2%	—	Med. Tall
5	*Dortchsoy No. 34	49.2	152	None	Trace	Trace	Med. Tall
6	*Dortchsoy No. 36	46.3	150	None	None	None	Med.
7	Dortch's Imp. Ogden	45.2	144	2%	8%	20%	Med.
8	Ogden (Okla.)	44.7	144	10%	40%	70%	Med.
9	Ogden	44.2	144	3%	25%	50%	Med.
10	Roanoke	42.4	166	None	1%	—	Med. Tall
11	Dortchsoy No. 16	42.0	155	None	Trace	2%	Med. Tall
12	Dortchsoy No. 7	41.3	138	None	None	None	Med.
13	Burdette No. 13	40.9	140	2%	50%	85%	Med. Tall
14	*Dortchsoy No. 33	40.8	139	None	Trace	Trace	Med.
15	*Dortchsoy No. 29	40.0	140	None	None	Trace	Med.
16	*Dortchsoy No. 28	39.9	132	None	None	2%	Med.
17	Mamotan 6640	39.7	175	None	—	—	Med. Tall
18	Mamloxi 388	39.3	176	1%	—	—	Med. Tall
19	*Dortchsoy No. 30	38.8	144	None	None	Trace	Med.
20	Ral soy	37.9	139	1%	10%	25%	Med.
21	*Dortchsoy No. 35	37.8	139	None	1%	3%	Med.
22	30967W	35.8	150	3%	10%	25%	Med.
23	Burdette No. 20	35.5	150	None	1%	2%	Tall
24	*Dortchsoy No. 38	35.4	140	None	None	1%	Med.
25	*Dortchsoy No. 15	34.6	133	None	1%	6%	Med. Short
26	Burdette No. 19	34.1	135	1%	10%	50%	Med.
27	54618-4-1-2	33.9	170	Trace	2%	—	Med.
28	S100	29.3	123	None	5%	75%	Med. Tall
29	Pelican	24.9	175	Trace	—	—	Very Tall
30	Macoupin	24.9	123	Trace	15%	60%	Med. Tall
31	Acadian	23.8	175	Trace	—	—	Very Tall
32	Purdue 7	23.3	119	None	20%	90%	Med. Short
33	Patoka	23.1	112	None	2%	35%	Med. Short
34	Hongkong	18.6	123	None	10%	40%	Med. Tall
35	Lincoln	14.6	110	None	10%	70%	Med. Short
36	Illini	11.9	113	None	25%	90%	Med. Short
37	Richland	11.2	110	5%	25%	100%	Short
Difference required for significance		3.9					
(*) Experimentals							



Soybean experimental plots in Holland.

Breeding Soybeans for HOLLAND

By DR. L. KOCH, Zeist Holland

AFTER breeding soybeans and other annual crops for 20 years in Java, Netherlands East Indies, I started in 1934 to breed soybeans for Holland.

It was evident that this would prove to be a tough job, but having no other work on hand, I decided to make a try. The climate of Holland differs considerably from that of other soybean growing countries. A cool and often dry spring with severe frosts is followed by a cool summer with 16 to 17 hours daylight (July average 17° - 19° C) and a rainy autumn.

If soybeans could be grown in our country, the proper soil for them would be the dry poor sandy soil that covers large parts of southern, central and eastern Holland. as farmers in these parts are most anxious to have a paying leguminous crop in their rotation, which now consists of rye and potatoes, or, under somewhat better agricultural conditions, with mangolds and oats added. But on these soils killing frosts are apt to occur as late as the end of May.

From the beginning the Department of Agriculture was very much interested in my scheme and gave me every possible assistance. The large and growing importance of the soybean for Holland is shown in the table given in this article.

Average yearly import in Holland in tons*

	soybeans	soya oil	soya cakes
1920-1924	9.319	32.172	18.470
1925-1929	26.540	47.522	37.586
1930-1934	50.572	29.524	29.093
1935-1939	100.776	12.309	14.930

*Centr. Bur. Stat. The Hague.

The breeding program consisted of the trying of every variety that could be imported, the selection of strains from mixtures such as were imported from Manchuria for processing purposes, keeping a

lookout for mutations and for natural hybrids and the breeding of hybrids from promising strains.

Preliminary tests showed me that soybeans should not have been sown before the 5th of May in order to escape killing frosts. It was obvious that the 1st of October was the latest date for harvesting and that in practise the beans should be ripe before the 15th of September. If possible they should be ripe somewhat earlier, so that the soybean harvest would not interfere with the potato harvest.

Before 1934 soybeans had been grown only on a very small scale for scientific purposes. Starting with this collection, varieties were imported from every country that was willing to send them. They came from tropical countries as well as from southern Siberia and northern Japan, from Poland as well as from Chili and South Africa. Some samples were evidently mixtures. If the mixture looked promising, selections were made and these were tried the next year.

In total 2,064 varieties and strains from 22 countries were tested up to the beginning of the war. A large percentage proved to be short day varieties. They flowered in September when there was a 12 hour day. Many more did not flower at all. Most of the strains that did ripen were too late to be of any value. Other strains ripened some pods at the base of the stem while still in full bloom at the top. Only seven out of 2,064 made a passable impression. Each of them however was deficient in one or more of the principal qualities required.

Of the trade samples of Manchurian soybeans (imported for processing) consisting of many thousands of different types, only a few plants ripened. The next year



Dr. Koch removing anthers from soybean flowers.

three of them were sufficiently early to be valuable for crossbreeding. The varieties and strains chosen were: Kurakake, Aosakigake, O Yachi, Yoshioka Chinrin and Kurome-to from Japan; Batorawka from Poland; Manitoba brown from Canada; and Weka, Eureka and G 320 selected from Manchurian samples.

The testing was hampered by seedborn diseases. Virus diseases in the long run were entirely stamped out by keeping all new and suspected strains in quarantine and roguing out all suspected plants (sometimes daily).

Although I was constantly on the lookout for mutations, only a few were found and these had no value from the standpoint of a breeder. By treating sprouting seeds, young plants and young buds with a 0.1 percent and 0.4 percent solution of colchicine, an attempt was made to produce mutations. Some of the plants were damaged but no polyploids were found.

It was obvious that the possibility of finding varieties of direct use in foreign varieties was absolutely inadequate. Either

(Continued on page 24)

Removing the diseased plants in the experimental plots.

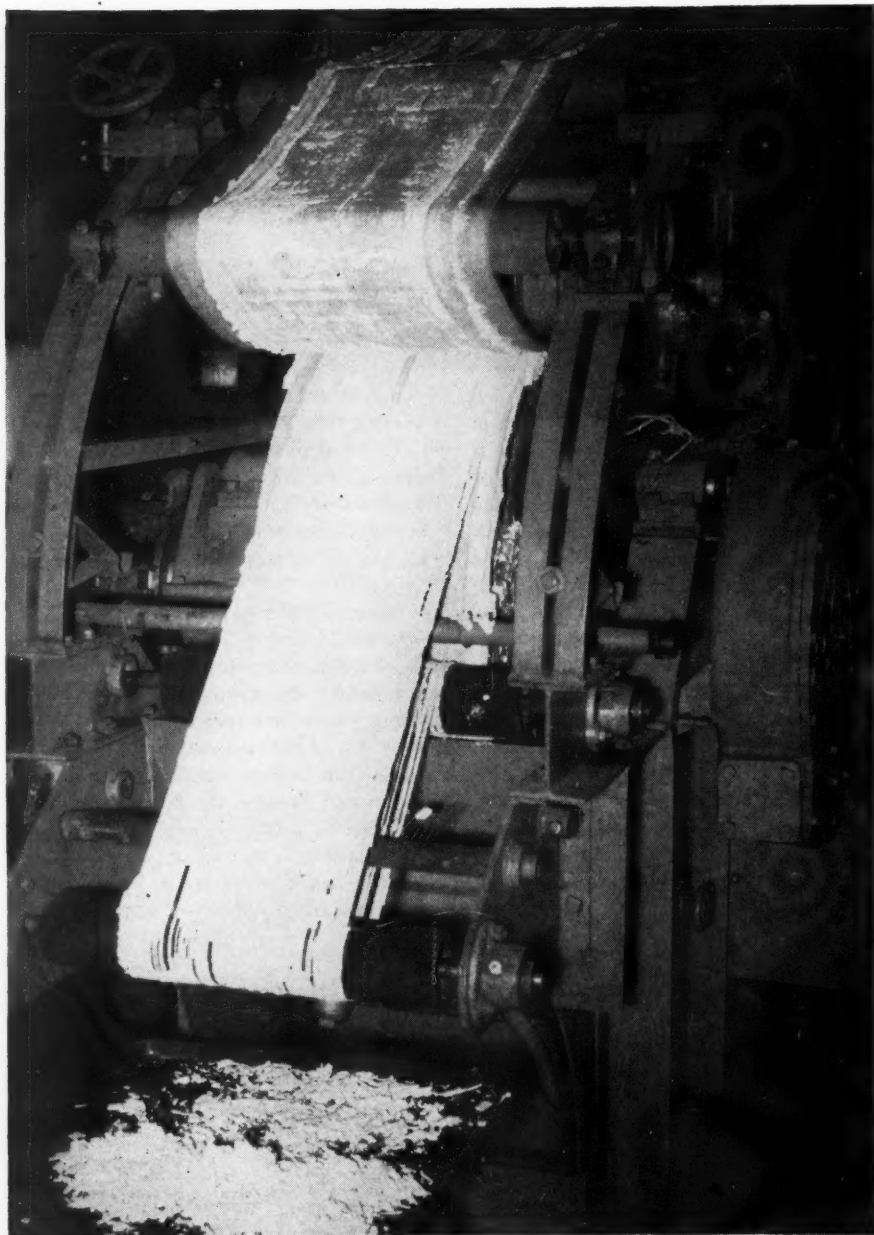


PROTEINS

As Industrial Raw Materials

By A. K. SMITH

Oil and Protein Division, Northern
Regional Research Laboratory*
Peoria, Ill.



Soybean protein pilot plant filter in operation at Northern Regional Research Laboratory, Peoria, Ill.

• Both animal and vegetable proteins are treated in this article by Dr. Smith. Use of proteins in industry has been expanding rapidly the past few years. They are now entering such promising fields as plastics, synthetic fibers, paints and fire extinguishers and insecticides.

(Reprinted from Chemical Industries)

THE PROTEINS, as industrial raw materials, are slowly but surely reaching out for larger and more diversified markets. Research and industry have discovered or devised new processing methods, produced new products, and extended applications. Sources of protein have expanded. Problems created by the need for new materials and by changing methods of fabrication have opened up new possibilities. As a result, although the chief uses of proteins are still in the very broad field of gluing†, they are successfully invading other fields. Increased industrial utilization is greatly enhancing their importance.

Historically, the use of industrial proteins is quite old. Animal glues have been in use since the early Egyptian civilization. Yet the supply of such glues was limited until recent times. This situation was changed, however, about 60 years ago, when adequate refrigeration and transportation facilities gave rise to our organized meat-packing industry, with a consequent increase in animal wastes available for processing.

It is interesting to note that the vegetable proteins derived from farm crops did not make their appearance until after World War I—the isolated soybean protein coming on the market in 1933 and the corn protein, zein in 1938.

In comparison with general industrial development, it is evident that the proteins have advanced quite slowly. Two very good reasons account for this: first, the great importance of proteins as foods has limited the available supply for industrial uses to wastes, residues, and leftovers of the meat-packing, tanning, fishing, and dairy industries; and second, the very complicated chemistry of proteins has been slow to develop in the direction of industrial usefulness.

The basic problem of protein supply has now changed from one of scarcity to one of plenty. The scientific development of agriculture, increased efficiency of crop production through mechanization in farming, and the introduction into this country of the

* One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

† Paper coating is included in gluing, since a main function of the protein is to adhere the inert pigments to the paper.

SOYBEAN DIGEST

soybean have been mainly responsible for this change, and there is no reason to believe that maximum production has yet been reached.

SHORTAGE TEMPORARY

It is true that the tremendous food requirements resulting from World War II caused a temporary shortage of proteins, yet at the same time it stimulated and expanded agricultural production, which permits expectation that the postwar period will provide surplus proteins in our domestic market. This also has a bearing on estimating the supply of individual proteins, for whereas the byproduct nature of industrial proteins of animal origin may be one of their limiting factors, there is no such visible limitation to the production of vegetable proteins. The proteinaceous materials resulting from the processing of oil and starch, and the production of animal feed provides a very large and cheap source of materials from which to draw for protein production. The expansion of the uses of vegetable proteins therefore will be determined ultimately by their cost of production and the ingenuity of chemists in technical development.

The factors bearing on utilization of a plentiful supply of industrial proteins will also have a bearing on how successfully these proteins meet competition by other materials. Starch glues have given competition for 60 years; and more recently certain of the high polymers, such as the phenolic resins, are taking a very important place in the adhesive and glue industry.

In the present discussion, certain important proteins such as wool, silk, hair, and hides have not been included because they are utilized largely in their original form. In passing over these products, however, it is worth noting that their heretofore unchallenged position in their respective fields is in many ways affected by new chemical developments, and it is evident that continuation of their eminent position will be maintained only by improvement through chemical research as it applies to them.

In appraising the proteins as industrial raw materials it is important, therefore, to view them in the light of the abundance of the materials from which they are prepared, their respective costs in comparison with competitive materials, their present uses, and the possibility of developing new products through research. The disturbance of economic conditions by the recent war forestalls an accurate evaluation of some of these factors, but the data available are sufficient to indicate the general trends.

THE ANIMAL PROTEINS

The industrial animal proteins include (a) the packing house byproducts usually known by the names of animal glue, photographic gelatin, and edible gelatin, (b) fish glue, and (c) casein.

Animal glues are manufactured in larger tonnage than any other isolated protein and their use finds the greatest diversification in end products. The woodworking industry is credited as being the largest consumer of animal glue, followed by the paper industry in the making of gummed labels and paper boxes. The rayon textile industry was reported recently¹⁰ to be using in excess of 10 million pounds of animal glue yearly as a sizing material.

Other important uses are for kalsomine, matches, sandpaper, and hectograph duplicating processes. More limited but quite

mal glue, with the exception of its being maintained in a highly sanitary condition, has been produced in recent years at the rate of 20 to 23 million pounds annually and its selling price has ranged from 30 to 35 cents a pound.

In addition to research on animal proteins now on the market, research also is under way on the development of protein byproducts of the poultry industry; efforts are centered on chicken feathers and egg white obtained from broken egg shells in the powdered egg industry.

Perhaps the most interesting and spec-



—Chemical Industries Photo

Most soy protein was allocated to the Navy for use in a fire extinguisher during the war.

important uses are for book binding, rubber processing, coopering, and for the manufacture of print rollers and emery wheels. Yearly production of animal glues has ranged from 105 to 121 million pounds, with about 60 percent made from hides and 40 percent from bones. The U. S. Tariff Commission Report No. 135 on Glues, Gelatin, and Related Products gives prewar prices of hide glue in the range of 15-23 cents and of bone glue 11-14½ cents per pound.

Photographic gelatin is a highly specialized product, and its specifications, methods of manufacture, and data on domestic production are not generally available. Imports¹¹ before the war, principally from Germany, reached a peak of around 2 million pounds in 1937. It is probable that imports at that time did not account for more than 20 percent of the total consumption. Photographic gelatin is our most expensive protein, and although the prices vary considerably, it may be placed roughly at \$1 per pound.

Domestic edible gelatine, which is manufactured in much the same manner as ani-

tacular investigation reported on these poultry products is in the development of textile fibers. Lundgren et al.⁷ have made egg white fibers with tensile strength values when dry up to 70,000 lbs./sq. in. and chicken keratin fibers with strengths as high as 80,000 lbs./sq. in. These unusually high strength values are very significant with respect to the future possibilities of protein fibers.

Fish glue, a product of the waste materials of the fishing industry, is produced at an annual rate of 3 to 4 million pounds. Normally it sells at 20 to 22 cents a pound. About half of the fish glue now produced is packaged in small containers for manifold household purposes; its other most important use is in photoengraving.

Isinglass, an interesting product, is made mechanically from fish sounds (bladders) and is used chiefly in clarifying beer and wines. It has been produced intermittently in this country, but maximum output has not exceeded 85,000 pounds.

Casein, a byproduct of the dairy industry, is second in importance to the so-called pack-

ing house glues. It is a protein of skim milk, precipitated either by acid or rennet. Skim milk is also the source of the important food product known as "non-fat dry milk solids." The dry milk solids constitute the entire solids content of skim milk, and the precipitated casein amounts to over one-third of this total. In a competitive market the dry milk solids is the more valuable product and has first call on the supply of skim milk, which places casein at a serious disadvantage and accounts in large measure for its fluctuations in production and in price.

To offset these fluctuations in domestic production, imports of casein have been heavy, the principal source of foreign supply being Argentina.

The most important use for casein is in the paper coating field which normally con-

sumes approximately 70 percent of the total supply, and another one of the most important products of casein is textile fibers, production of which started in this country about 1938. A production capacity for fiber of 1 million pounds a month has been reported. Since the casein fiber has properties differing from those of rayon, cotton, and other fibers and possessing, in fact, a resiliency resembling that of wool, it is believed to have a very promising future.

A new project closely related to the development of textile fibers and inspired by war shortages in hog bristles is the production of artificial bristles from protein. These bristles are recommended for use in paint brushes and similar products. While the initial experiments were worked out with casein, other proteins such as soybean protein and zein may prove equally satis-

factory. The results on bristle development as described by McMeekin and others⁹ are very encouraging for a new application of proteins.

Substantial quantities of casein are used in plastics for making buttons, buckles, ornaments, plywood adhesives, cord tires, water paints, and leather finishes. It also is in demand as a spreader and adhesive in insecticide sprays, for special foods, and for medicinal purposes.

VEGETABLE PROTEINS

The vegetable proteins, as indicated previously, have entered the protein field in comparatively recent years, due to the remarkable strides in soybean production and to research in utilization of farm crops. Inasmuch as we may expect little if any substantial increase in the quantities of animal protein available for industrial use, a steady and abundant supply of vegetable proteins is of utmost importance.

Vegetable protein supply may be based partly on the adaptability of soybeans to fit into good land use practices and cropping plans. This crop can be utilized by farmers either as a cash seed crop or for forage. There also has developed among farmers a greater understanding and appreciation of balanced livestock rations, resulting in a definite dependence on soybeans to supply a part of the feed requirements of farm animals and poultry.

Furthermore, the phenomenal success of soybeans as a farm crop over other possible sources of oil and protein, can be accounted for in large measure by the ease of cultivation and harvesting, thus making the soybean the cheapest source of crude protein. Production of soybeans in 1941 was 100 million bushels, but war requirements for oil nearly doubled this production in each of the ensuing years to date.

The solvent-extracted soybean oil meal, containing about 45 percent protein, is the raw material for protein isolation. In 1937-39 this meal sold at about 1/2 cent a pound. Production figures for isolated soybean protein are not available, but the annual capacity is reported to be in excess of 15 million pounds, and more production capacity is known to be contemplated.

Before the war, soybean protein was sold principally to the paper industry for sizing and coating paper; substantial amounts were used also for the manufacture of water paints. During the war, the greater share of the production was allocated to the Navy as a fire extinguisher,¹² a use in which it is unexcelled.

Zein, the alcohol-soluble protein of corn, is extracted from corn gluten, which is the protein concentrate obtained during the wet-milling of corn in the manufacture of corn starch. The potential yield of zein is

A COMMODITY SERVICE

That Meets Today's Conditions

RAPID changes in commodity prices require not only constant attention but a knowledge of factors which daily influence the markets. This is especially true now that most controls and restrictions have been removed and free competitive markets are again in operation.

For example, if you are carrying a heavy inventory, you may wish to consider the possibility of hedging in order to prevent taking a capital loss should the market develop sharp declines.

Our Commodity Department is able to offer the latest information on current markets and to coordinate that information with long-term market trends. Our offices in 91 cities enable us to transmit the information you need promptly and efficiently over our 40,000 miles of leased wires.

We will be happy to place our nationwide commodity facilities at your service in meeting your commodity requirements.

MERRILL LYNCH, PIERCE, FENNER & BEANE

*Brokers in Commodities and Securities
Underwriters and Distributors of Investment Securities*

70 PINE STREET

NEW YORK 5, N. Y.

Offices in 91 Cities

3 pounds per bushel of processed corn, and the corn wet-milling industry is processing in excess of 110 million bushels of corn annually.

Zein is used in ink manufacture, in making excellent phonograph records and as a special coating for paper, but its most important application, greatly stimulated during the war, is in combination with rosin as a shellac replacement.

Soybean protein, zein, and peanut protein are under investigation as a source of textile fibers. The work on zein fibers⁶ is advancing rapidly and is ready for large-scale pilot plant operation. The published data give dry tensile strength values of 1.25 g./denier and wet strength values of 0.55 g./denier, while unpublished results show substantial improvements over these values. Other important properties of the fiber, such as shrinkage, can be controlled.

Soybean fibers are in pilot plant production,³ and reports indicate these fibers are equal to the commercial casein fibers now in use. Peanut protein fibers are in the pilot-plant stage of production in England.¹¹ They are called "Ardil," and their commercial production seems to be assured.

The chemistry involved in the formation of textile fibers from proteins is exceedingly complicated and has slowed the progress of this development. The evidence thus far accumulated, however, leaves little doubt that production of protein textile fibers ultimately will develop into an important industry.

The use of proteins as protective colloids in oil emulsion paints deserves special mention.

This application is progressing without systematic technological attention, but it is increasing steadily in popularity.

While soybean protein and zein are the only isolated vegetable proteins currently produced in substantial tonnage, a number of other proteinaceous materials are available for protein production, and an intensive research program is under way on isolating these materials and studying their properties. The more important members of this group include peanuts, cottonseed, flaxseed and wheat.

Other protein and oil-rich seeds under investigation as new farm crops and which are potential sources of protein include sunflower, castor bean, safflower, mustard, and fanweed. The probable success of these crops will depend as much on their soil and climatic requirements and their ease of cultivation and harvesting as it will upon their yields and composition.

PROTEINACEOUS MATERIALS

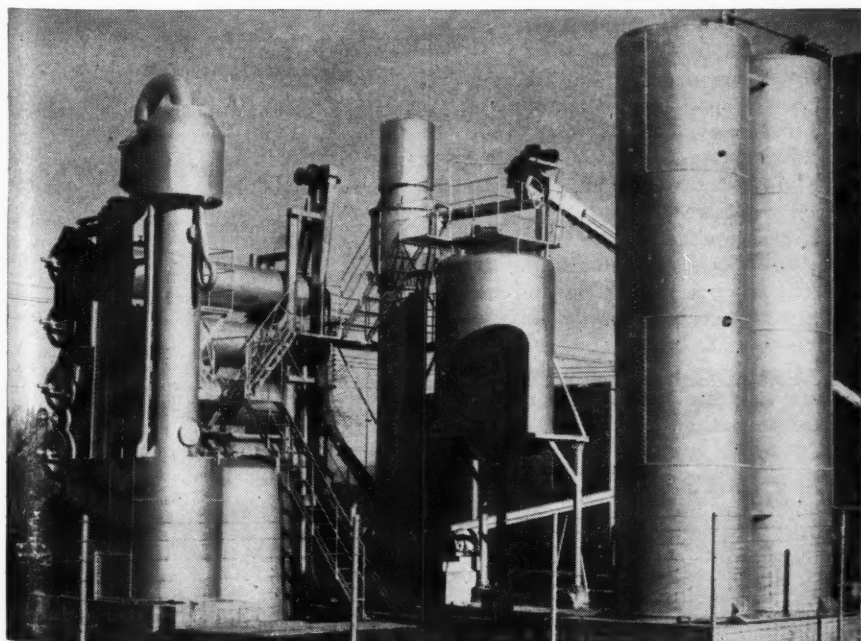
The oil-free meal derived from oil seeds or cereal grains and containing 40 to 70 percent protein is not only a raw material for the manufacture of isolated protein but it also has many potential industrial applications. The I. F. Laucks Co. introduced soybean oil meal glue to the Douglas fir plywood industry in 1927 where it has played an important role in plywood development. The tonnage consumed is greater than that of any other plywood adhesive, and total consumption in the hard and soft plywood industries has ranged from 20 million to 45 million pounds annually.

The wallpaper industry utilizes substantial quantities of soybean oil meal as an adhesive. In recent years this meal has also been used with satisfactory results in combination with casein for the brush coating of paper and in the formulation of water paints.

The Ford Motor Co. was probably the first to use soybean oil meal as an extender for phenolic resins. Laboratory investigations⁸ have shown that the standard soybean oil meal, normally used for stock feed, is not as satisfactory for this application as the special meal preparations which have had their water-soluble fractions removed. The war interrupted the progress of this

V. D. Anderson Extraction Unit

The solvent extraction unit of the V. D. Anderson Co. recently added to the firm's expeller line. This is an outdoor installation. A small two-story building is required for product preparation and finishing. One operator can handle the entire preparation, extraction and finishing operation.



DECEMBER, 1946

Soy

Cargill

INCORPORATED

PROCESSORS

MILLS AT

Minneapolis - - - Fort Dodge

Cedar Rapids - - - Springfield

plastic development, but with the return of peace a renewed interest in this application is expected.

Recent investigations have shown that soybean oil meal, corn gluten, and probably the other proteinaceous materials can be used to excellent advantage in extending phenolic resin for fabricating waterproof plywood glue.² When used for this purpose, as for plastics, the meal must be low in water soluble constituents. The cost of such products is low, ranging from 3 to 5 cents per pound, and their use effects a substantial saving in the cost of a waterproof glue line.

Burnett and associates,⁴ working with peanut and soybean proteins, have demonstrated for the first time that these materials can be used in the preparation of

tacky and remoistening adhesives. With the paper industry intensively developing new types of packaging and other designs of paper fabrication, an additional supply of tacky adhesives should find a ready market.

CHEMISTRY AND COMPETITION

The various isolated proteins differ markedly in physical and chemical properties. This difference along with a difference in source of supply and price structure has kept them largely in separate fields of application and minimized competition between them. The two proteins which are most competitive are casein and soybean protein. It is worth noting, however, that soybean protein came into very substantial production during a period when the total

supply of casein was greatly increased.

Packing house and fish glues, which are the only truly water-soluble industrial proteins, are noted for their excellent gelling characteristics at low protein concentration. The casein and soybean proteins are readily dispersed in a mild alkaline solution, whereas zein is the only industrial protein soluble in organic solvents. This gives zein a field of application not generally invaded by the other proteins.

The high molecular weight of the proteins brings their chemistry into close comparison with synthetic polymer chemistry. Perhaps the chief difference in protein chemistry and that of the high polymers is that the protein molecule is made up of a greater variety of building units, since they may contain 15 or more different amino acids. The proteins also have a high percentage of their molecular weight in their side chain structure and possess a highly polar group at the ends of most of the side chains. In fact, there is no high polymer of commercial importance that can equal a protein in proportion of polar groups. Translated into practical results, the highly polar nature of proteins gives them a greater water absorbing capacity than most of the synthetic polymers.

The problems of plastic flow and cross-linking, which are very important in plastic investigations, and that of the orientation of chain structures in fiber formation are common to both synthetic high polymers and proteins.

While the chemistry of proteins has been slower to unfold than the chemistry of other natural products, major advances have been made in this subject during recent years. The combination of new advances in protein chemistry with the continued development of fibers, paints, and other products, and the natural growth of industries that depend upon proteins indicate a substantial increase in the future use of industrial proteins.



We wish it were this easy!

● If you know a magician who specializes in freight cars, please tell him he's wanted by the railroads! The demand for cars to move this year's record-breaking grain and other crops still continues—other demands for cars are considerably greater than a year ago. As a result there just aren't quite enough cars to go around.

You see, wartime service took a heavy toll of freight cars, while restrictions made it impossible to get all the new cars we needed. Railroads have 50,000 cars on order, but shortages and disturbances in production have held up deliveries. We still haven't enough new

cars to replace those worn out carrying wartime traffic.

Railroads are calling upon all their experience to speed up the handling of cars and the movement of trains. They have been moving about 150,000 loaded cars a day—furnishing 90% of the freight cars ordered.

Industries are helping to meet this serious situation by re-establishing the war-time practice of loading and unloading freight cars promptly—six full days every week.

Working together, railroads and shippers can meet the transportation needs of the nation.

AMERICAN RAILROADS

TRANSPORTATION BLDG., WASHINGTON 6, D. C.



IN PARTNERSHIP WITH ALL AMERICA

REFERENCES

1. Babcock, G. E. and Smith, A. K., USDA Bulletin AIC-65.
2. Boyer, R. A., Ind. Eng. Chem., 32, 1549 (1940).
3. Burnett, R. S., Parker, E. D., and Roberts, E. J., Ind. Eng. Chem., 37, 980 (1945).
4. Sixteenth Census of Manufacturers of the United States (1940), United States Department of Commerce, Bureau of the Census.
5. Croston, C. B., Evans, C. D., and Smith, A. K., Ind. Eng. Chem. 37, 1194 (1945).
6. Lundgren, H. P. and O'Connell, R. A., Ind. Eng. Chem., 36, 370 (1944).
7. McKinney, L. L., Deanin, Rudolph, Babcock, G. E., and Smith, A. K., Ind. Eng. Chem., 35, 905 (1943).
8. McMeekin, T. L., Reid, T. S., Warner, R. C., and Jackson, R. W., Ind. Eng. Chem., 37, 685 (1945).
9. National Association of Glue Manufacturers, Rayon Textile Monthly, 26, 75, 283 (1945).
10. Trail, David, Chemistry and Industry, No. 8, Page 958, (Feb. 24, 1945).
11. U. S. Patent 2,269,958.
12. U. S. Tariff Commission Report No. 135, Second Series.



Greetings

Here's an old fashioned and sincere wish from all of us at Dickinson's to all of you . . . to each of you individually, wherever you may be, for a very happy holiday season and a prosperous 1947. Now is a time for remembering with thanks, the fine business relationships we've had with you during the year just ending. Now, too, is a time for pledging to you our continuing efforts to be worthy of your trust and patronage.



Farm Laboratory Division

THE ALBERT DICKINSON CO.

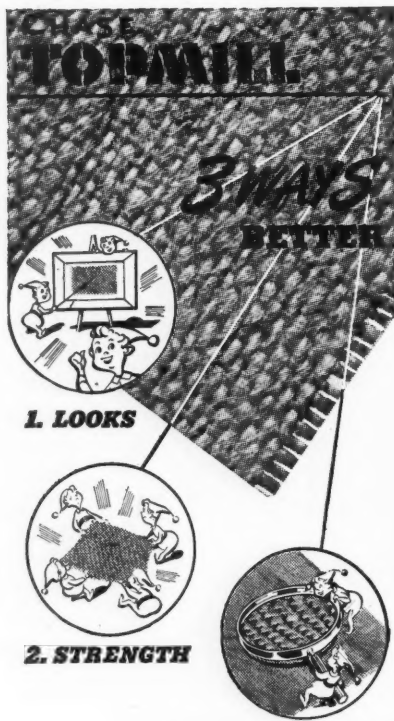
BOX 788, CHICAGO, 90, ILL.
ESTABLISHED 1854

SOUTHERN OFFICE AND WAREHOUSE, 3013 N. STATE STREET, JACKSON, MISSISSIPPI

NAD-A-GEN

The Pre-Tested Inoculator
The Crop and Profit "Pepper Upper"

DECEMBER, 1946



• Not just 1, or 2, but 3 ways better, Chase TOPMILL burlap looks better, wears better, IS better! And here's why: Chase buys only from the mills in India whose products meet our high standards—standards of appearance, strength and weaving that are the result of 99 years' experience in the bag business.

To assure you real TOPMILL quality, a Chase burlap expert went to the Calcutta burlap market. He inspected mills, checked samples, made recommendations—all with *your* needs uppermost in mind. The result is Chase TOPMILL—the better burlap with looks, strength, and uniform weave.

Specify this better burlap by name—Chase TOPMILL.

**Chase Brite-Weaves
No Finer Burlap . . .**

Specify Brite-Weaves for premium-grade burlap. Rich, light-colored burlap—not specky or fuzzy. Extra thread count. Fine, even weave with silk-like sheen. It's the aristocrat of burlaps!



FOR BETTER BAGS—BETTER BUY CHASE!

CHASE BAG CO.

GENERAL SALES OFFICES

309 WEST JACKSON BLVD., CHICAGO 6, ILL.

BOISE • DALLAS • TOLEDO • DENVER • DETROIT • MINNEAPOLIS
ST. LOUIS • NEW YORK • CLEVELAND • MILWAUKEE • PITTSBURGH
BUFFALO • KANSAS CITY • MEMPHIS • GOSHEN, IND. • PHILADELPHIA
NEW ORLEANS • ORLANDO, FLA. • SALT LAKE CITY • OKLAHOMA
CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS
CHAGRIN FALLS, O. • HUTCHINSON, KAN. • WINTER HAVEN, FLA.



USDA MEN WHO HAVE CONTRIBUTED TO SOYBEAN DEVELOPMENT

★ ★ ★

PAUL R. HENSON

Paul R. Henson has been southern coordinator of the U. S. Department of Agriculture's Regional Soybean Laboratory since July 1942. He works at the Delta Experiment Station, Stoneville, Miss., supervising cooperative work on soybean improvement in the 12 states that make up the southern wing of the Laboratory and carrying on the soybean experiments at his home station.

He has been with the Division of Forage Crops and Disease of the Agricultural research Administration for 15 years and is familiar with the region and the soybean work going on in the various states. He plans and conducts agronomic and breeding experiments and as a result of the work already done superior grain types of soybeans for the region will be available in the near future. Previously the forage types were the main southern goal, but the war emergency demand for fats and oils speeded

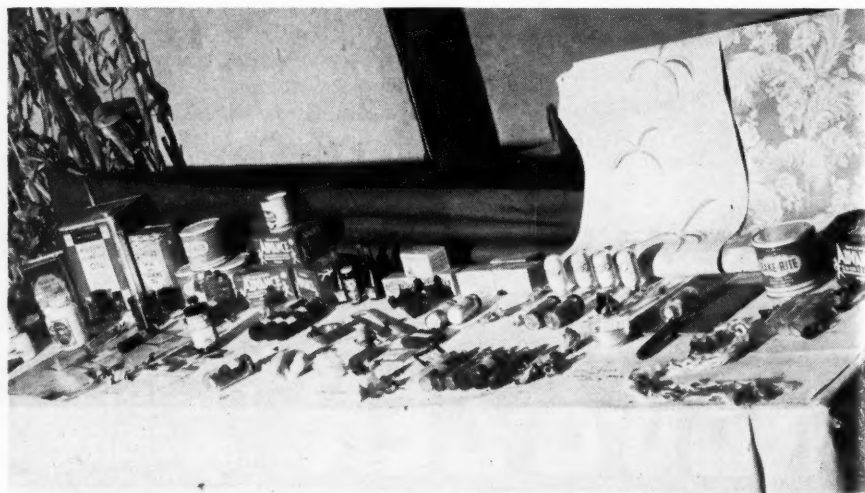
up the development of the grain types with high oil content.

Henson and the research men of the various states were enabled to do rapid development work because of the vast amount of available hybrid material, selections and introductions; interchange of promising strains among the stations; and extensive variety nursery plantings. In addition to the grain varieties, they have also been building up better vegetable varieties for the region.

Mr. Henson, who was born at McCloud, Okla., 41 years ago, got his B. S. degree at Iowa State College and his M. S. at the University of Maryland. He was in charge of the department of alfalfa investigations at the Delta Experiment Station from his appointment in 1930 to 1938 when he was transferred to the Plant Industry Station at Beltsville, Md. Expansion of the soybean cultural and improvement work took him back to Stoneville in 1942.

Kansas Soybean Display

Part of a display of soybeans and soy products prepared by Thomson's Soya Mill and shown at Hiawatha, Kans., Crop Show, held this year in conjunction with the town's annual Hallowe'en Festival. An estimated 7,000 people saw the show. The event on Hallowe'en has been held in Hiawatha for the past 32 years.



COMES TO DEFENSE EARLYANA BEAN

To the Editor:

I note the interesting comment of Mr. H. I. Cohn in the October issue of the *Soybean Digest*, page 18, in which he implies that Earlyana should yield with the Lincoln soybean.

Since the former was developed in Indiana, and the Lincoln has been extensively tested here at the Purdue University Agricultural Experiment Station, I feel it unfair to be critical of the Earlyana for yielding less than the Lincoln. Certainly, under our conditions, we do not expect it to yield with the latter.

It matures on the average several days earlier and is designed for use in the northern part of this state where a shorter season variety than the Lincoln is needed or it is used for delay in planting in central Indiana. Earlyana has remarkable ability to grow off rapidly and produce a crop in less days than the Lincoln and other varieties of similar maturity.

I do not know of any comparative experiment station results indicating that the two are similar in yielding ability over a period of years, nor do I know of anyone who has distributed the Earlyana with the recommendation that it will yield with the later varieties. In fairness to the variety and its usefulness, I feel that it should not be discredited when grown under conditions that place it in competition with the later high yielding Lincoln.—K. E. Beeson, extension agronomist, Purdue University, Lafayette, Ind.

—s b d—

SOLVENT PROCESS FOR COTTONSEED

A pilot plant for a solvent extraction of oil from cottonseed and other oil bearing seed will soon be constructed at Swift & Co's. oil mill in Memphis, Tenn., according to P. A. Laws, oil mill district manager.

"This project is of a research nature to determine whether this method of extraction, which has been used successfully in soybean oil extraction, is equally suitable to cottonseed milling operations," says Laws.

The buildings will consist of preparation and extraction buildings of steel frame construction with corrugated transite covering. They will be located directly north of the existing cottonseed crushing building.

—s b d—

FORD MOTOR CO. DROPS SOYBEAN OPERATIONS

The Ford Motor Co. has announced sale of its soybean processing plant at Saline, Mich., to Soybrands, Inc.

The sale is in line with the firm's recently announced policy of eliminating

many operations unrelated to actual production and sale of automobiles and trucks.

The Ford firm, one of the early pioneers in industrial uses of soybeans, is now entirely out of the soybean business. The firm's processing plant at Rouge was dismantled 6 months ago.

The Saline plant was built in 1936.

—s b d—

NEW IMPLEMENT FIRM

The Ford Motor Co. will organize a new company to manufacture and distribute farm implements and machinery

in an "intensive program," Henry Ford II, president, has announced.

Meanwhile, officers of Harry Ferguson, Inc. began a search for new plant facilities to make tractors after Ford discontinues its production arrangement with Ferguson next June 30.

The end of the day-to-day arrangement between Ford and the Ferguson company came as no surprise to the tractor industry, since the Ferguson company earlier this year made arrangements to manufacture its product in the British Isles in competition with Ford's Fordson tractor, on which output has never stopped in Britain.

Faster
GRINDING
FORDS
Industrial Hammermill
40 to 150 H.P. Capacity
All Steel, Welded

Saves Up to HALF Your Power Expense!

The FORDS Hammermill offers you two big advantages: (1) FASTER GRINDING, (2) BIG SAVINGS IN POWER—**proved** in actual tests.

Recently, the FORDS was tested alongside other leading hammermills by a well-known power company in Wisconsin. In these tests, the FORDS used



FORDS PORTABLE HAMMERMILL

less than **half** as much power per cwt. of grinding as the other hammermills tested. This savings in power with a FORDS increases your profits by many hundreds of dollars during the lifetime of the mill . . . and, it gets your grinding done faster, just the way you want it.

Let us send you more information. Write . . .

MYERS-SHERMAN CO., 1407 12th St., Streator, Ill.

FOR HOTELS,
RESTAURANTS—

SOY PRODUCTS IN QUANTITY COOKERY

In these days of inflated food costs and straining budgets there is a renewed lively interest in cheaper foods on the part of managers of many institutions.

Many managers of hotels, restaurants and college dormitories and school cafeterias are successfully using some form of soybean products as a means of holding down costs. Others undoubtedly would if they knew where to obtain them and had recipes and instructions for their preparation.

Such people will find of considerable use a publication just issued by the section of home economics of Michigan State College. This is Bulletin 204, *Soybeans and Soy Products in Quantity Cookery*, by Margaret M. Childs, Elizabeth Gruginskis Additon and Mabelle S. Ehlers.

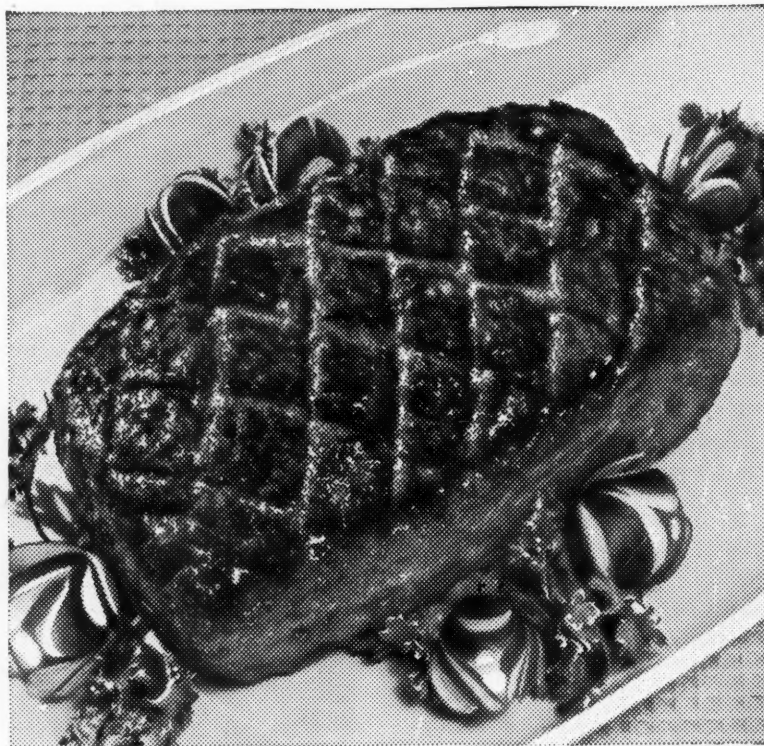
The booklet contains a thorough discussion of the usage of such soy products as whole green and dried beans, soy sprouts, soy flour, grits, butter and milk. It discusses the advantages and drawbacks of each product, and how to overcome the drawbacks.

There are also 36 pages of recipes for quantity preparation in the booklet, covering a very wide variety of dishes including soups, loafs, salads, omelets, breads, cakes, puddings and pies.

"Certain types of institutions will, doubtless, always be interested in cheap sources of adequate protein," states the bulletin. "Since soybeans provide such a source, as well as vitamins and minerals and a very large amount of fat, it can readily be understood why these beans have been referred to as versatile.

"Though cheapness may be an important factor in determining an institution's use of soy products, other qualities should not be overlooked. Appearance and palatability influence customer acceptance, hence soybean dishes and other soy products must look attractive and taste good. They must also be simple enough to prepare so that they are not beyond the ability of institution cooks or require expensive or unusual equipment not at hand or not easily obtainable."

The information for the recipes has been obtained chiefly from experimental



—A. E. Staley Mfg. Co. Photo

MEAT LOAF — YIELD 48 SERVINGS

Ingredients	weight or measure
Beef, ground	2½ lb.
Pork, ground	2½ lb.
Medium onion	6 oz.
Carrots, grated raw	12 oz.
Soy grits	2 lb.
Green pepper, chopped fine	1
Salt	½ t.
Bread crumbs, dry	5 oz.
Water	3¾ qt.

Procedure:

1. Mix all ingredients together in large bowl and mix well.
2. Shape into loaves and place in bread pans.
3. Bake at 375° F. for 45-50 minutes.

From Michigan State College Bulletin 204,
Soybeans and Soy Products in Quantity Cookery

work done by the members of the department of institution administration of the School of Home Economics of Michigan State College.

The beans were cooked in various ways. They were sprouted and the sprouts served. Soy butter, milk, grits and flour were used in varying amounts in different products. All such food preparation was done under institution conditions.

The resulting products were served to and consumed by members of the institution staff, dormitory residents and other groups on the college campus as well as by the students in the East Lansing high school cafeteria.

The following advantages of using soy-

beans and soy products in institutions are listed:

1. High-fat soy flour is a shortening extender. In butter cakes and in pastry, it permits a reduction in shortening to some extent.
2. The use of soy flour in baked products permits the use of fewer eggs.
3. Soybean vegetable milk may be used in place of market milk when the latter is impossible to obtain or available from contaminated sources only. Hospitals may substitute soy milk for cow's milk for patients who are allergic to the latter.
4. The protein of soy products may be used as a supplement to that of meat, milk or eggs since such soy products combine

well with all of these items. Soy grits used in meat loaves and hamburgers not only serve as extenders of the meat but result in satisfactory products of good flavor and texture, texture actually being improved in the opinion of some experimenters. The cost of the recipe is also reduced.

5. Soybeans and soy products are economical to use. Soy products may be used to replace more expensive food items.

6. The patron's diet is improved by the added protein, vitamin and mineral content when soy products are used.

7. Soy sprouts furnish a green vegetable available at all times of the year. They may be used as a vegetable by themselves or in combination with other things as in chop suey, in salads, with eggs as in eggs foo yong or in bean sprout omelet and so on.

NEED FOR STANDARDIZATION

The bulletin points out a definite need for standardization of soy products, since they vary considerably with different manufacturers.

Following are some of the bulletin's recommendations:

Although soy flour may be satisfactorily substituted for part of the wheat flour in any recipe, it is recommended that special recipes be used if larger substitution than 10 percent in cakes and 4 percent in breads is desired.

When soy flours are used, the addition of more liquid is necessary. The low-fat flours have an even greater water-holding capacity so that still more liquid must be added. With high-fat flour, the shortening may be reduced. With all three types of flours, if used in high concentration, the addition of more seasoning or flavoring is needed. Products made with any of the soy flours have a rich yellow color resembling that obtained when liberal quantities of eggs are used.

Cookies, muffins, coffee cake and cakes were made successfully in this study, substituting soy flour for wheat flour in proportions ranging from 24 to 100 percent. Brownies were satisfactory with a 100 percent substitution. Plain cake was satisfactorily made with a 24 percent substitution. In chocolate cake, 30 percent was possible, perhaps because the chocolate masked the soy flavor. Fifty percent substitution was used in an eggless spice cake with no detriment to flavor or texture. It was necessary to increase the liquid in this spice cake to a considerable degree. However, since soy flours vary in moisture content, the amount of liquid to be used in any cake depends on the kind of flour used.

White sauces were not successful when made with soy flour. A chocolate sauce made with soy milk and soy flour was

successful, probably owing to the masking of the soy flavor by the chocolate.

Points stressed in using soy flour, which of course are applicable in the home kitchen as well as the institution:

1. Use lower oven temperatures as soy browns quickly.
2. Increase the seasoning or flavoring.
3. Increase the liquid.
4. When using soy flour in sauces, do not depend on it for thickening since it contains practically no starch.
5. Adjust the other ingredients to the type of flour being used.
6. A slight reduction in volume is to be expected when using soy flour in cakes.
7. Pie crust made with part soy flour is somewhat more difficult to handle than all-wheat flour doughs.

Concerning the use of soy grits as meat extenders and for other uses, the publication states:

Grits vary in size, color and shape with the manufacturer but all resemble bits of cereal.

Soy grits as such may be used in meat loaves successfully. In ham loaf, the proportion of grits to meat used in this study was 1:5, yielding seven servings per pound of meat. In the meat loaf the proportion of grits to meat was 1:2.5, yielding 9.6 servings per pound of meat. Since the protein in meat varies from 3 to 19 percent while the protein content of the grits is 52 percent, not only do the grits serve as a substitute for part of the meat, but they provide an additional amount of protein. The grits may be used in varying proportions up to 50 percent of the amount of meat used. This, of course, reduces the cost of meat loaf materially.

USE GRITS IN CAKES

Another interesting use for grits is the addition in amounts as desired, to cookies, muffins, coffee cake and yeast bread and rolls. Used in this way the grits resemble chopped nut meats.

The use of a soy butter as shortening in the making of standard gold and chocolate cakes is discussed. It was found that both cakes made with soy butter were smaller in volume and less velvety in texture than those made with a standard shortening, but they had good flavor.

Concerning soy milk, it may be used in sauces, puddings, soups, and other foods with more or less success. Better results are secured with chocolate sauces than with white sauces.

A list of firms handling soy products is included in the bulletin.

— s b d —

ILLINOIS GROWERS LOST 50 MILLION

Illinois soybean growers lost an estimated 50 million dollars as a result of con-

flicting OPA policies and belated lifting of OPA ceilings, Charles B. Shuman, president of the Illinois Agricultural Association, Chicago, has charged.

Shuman said, "OPA lifted price control ceilings at a time when almost all of the 1946 crop was in the hands of processors and speculators."

Shuman recalled that when the price decontrol board held its hearings last August the Illinois Agricultural Association strongly advised against attempts to recontrol soybeans. During the 2 months price ceilings were restored farmers harvested and sold most of their 1946 crop.



A fast expanding industry like the growing of soybeans calls for fast expanding facilities for handling.

Neff & Fry super-concrete stave bins meet the need — so far as storage is a factor — and storage is a mighty big factor.

On the market 30-odd years and literally thousands of bins in service in industry, at elevators, on the farms.

Built any diameter or height. Trained erection crews. The job guaranteed in writing.

1946 CATALOG READY

THE NEFF & FRY CO.
CAMDEN, OHIO

NEFF & FRY

BINS

KOCH

(Continued from page 13)

natural hybrids had to be used or artificial hybrids had to be made. In a cool climate natural hybridization is extremely rare, even when varieties are grown next to one another. In Java with its hot and humid climate I had used natural hybridization as an easy way to cross varieties. "Male" and "female" varieties were grown in alternate rows, the "female" variety having white (recessive) flowers, the "male" one purple (dominant) flowers. Under ideal conditions about 1 percent of the plants in the next generation were hybrids.

Fredman
BAG CO
SINCE 1889

BAGS
for
SOYBEANS
AND
PRODUCTS

PRINTED
BAGS
For Individuality

Used
BURLAP
AND
COTTON
BAGS
*
TWINE

WE
BUY
SURPLUS
BAGS

FREDMAN BAG CO.
330 E. CLYBOURN ST.
MILWAUKEE 2, WIS.

Phone
DALY
4114

In Holland I trusted to my luck that in some seasons conditions would be favorable for such a method of hybridizing, as I found that artificial crossing is not very promising. In 1941 there was a heat wave during the flowering period and in 1942 44 hybrid plants were found. In 1943 under similar conditions the number was 21.

For several years however no hybridization took place. In 1936 a natural hybrid was found in an imported German variety "Hallesche fruhe kurze braune." The progeny showed several good points, but most of the strains were very susceptible to the bacterial blight and the seed was not of the edible type. Some selections however gave good varieties for further cross-breeding.

Artificial crosses were made during the years 1937-1944 but with very poor results. From 1946 artificial crosses only eight hybrids were procured.

The progeny of the afore-mentioned hybrids gave promise of the production of varieties much more suitable for conditions in Holland than the best of the imported strains. Only two of the latter ripened before September 20th. Hybrid plants however ripened as early as August 25th. These very early plants were too small to be of any value. Many vigorous plants were perfectly ripe in the beginning of September. The F³ and F⁴ populations were large enough to start selecting for such qualities as size, yield, seed color, seed coat splitting, seed size, etc.

The harvest in 1945 was very good and gave a promising aspect. It seems highly probable that the available populations may yield several good yielding, early ripening strains of edible soybeans. During the trials a great difference in taste and cooking qualities was found to exist and was made use of. In the selection prominence was given to edible types because these had chance to compete with beans when grown for home use by the small farmers.

Before the war some of the experimental plots were laid out in other places with a different soil and with less risk of frosts. In 1939, when it already looked as if the war was inevitable, the experiments were distributed over more plots, to lessen the risk of total loss. This proved to be a good measure. Several fields were destroyed but no valuable material was lost. During the war all trials had to be kept secret.

In 1944 there was a lot of trouble. Horses were stolen, weeding had to be postponed because the laborers had to hide from the slave hunting enemy. Foxholes were even necessary in the main experimental field, as an adjacent railroad and an airfield in the near proximity were sometimes bombarded and shot up.

The discarded seed gave us an excellent food in the terrible famine winter of 1944-1945, when official rations sank as low as 350 calories a day. Not only my family but several other persons were thus saved from starvation.

THIS SOYBEAN PLANT WAS A BIG YIELDER



This photo of a heavily podded soybean plant was mailed to the SOYBEAN DIGEST by E. F. Schuelke, manager of the Alta Farmers' Elevator & Supply Co., Alta, Iowa. Mr. Schuelke says the stalk was found in a field of Richlands. There were 302 pods containing 643 beans. We have received reports of single plants yielding as high as from 750 to 1,000 pods, and up to 2,500 beans. These, however, were in increase plots or isolated locations where the plants had abundant room.

— s b d —

FROM HEARTSILL BANKS

(To the Editor:)

Not much news from over here. The soybeans, some 611,000 acres of them, are grown in small fields, planted, worked and harvested by hand.

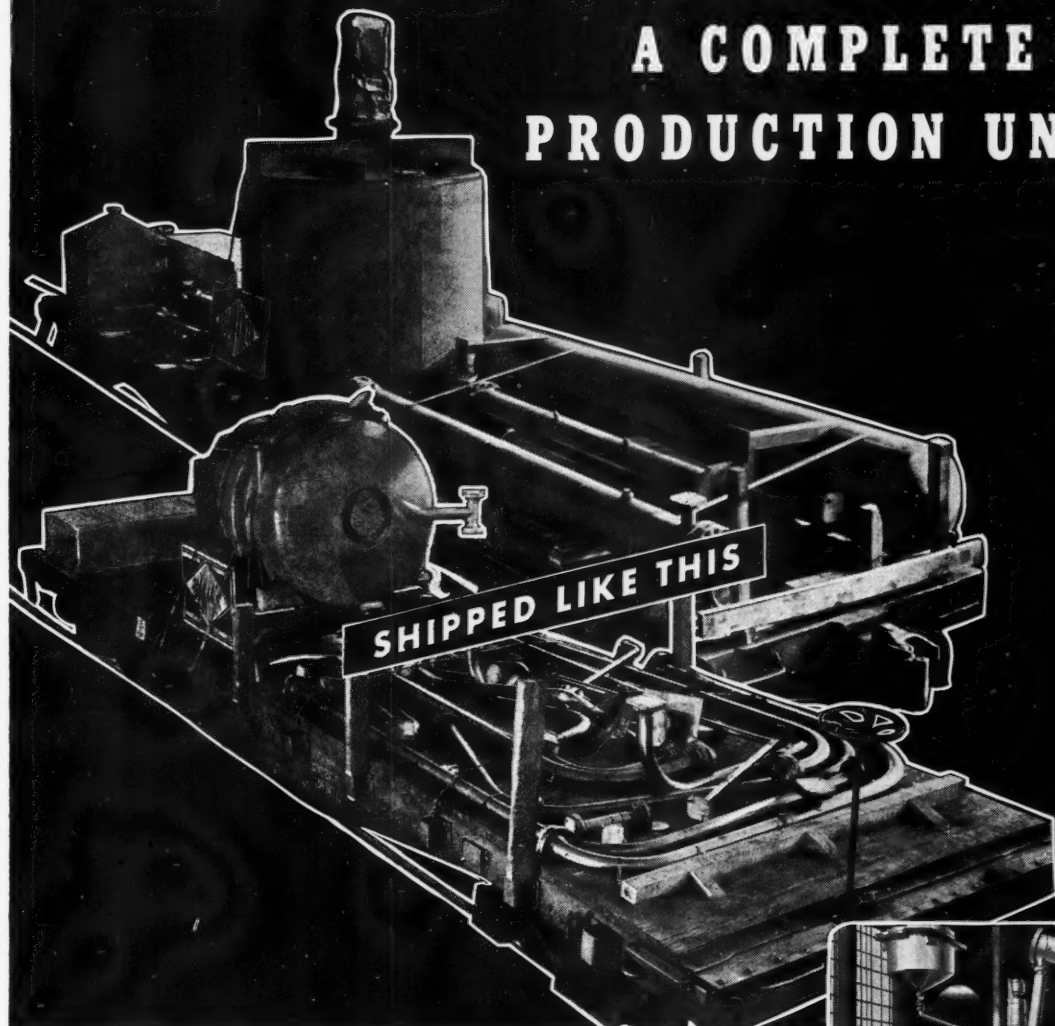
A rather small percent of them get to market commercially as each farmer eats a great many. They pull up stalks and all and bring them into the villages to let them be threshed by the women and children.

Koreans also eat a lot of barley and millet, although rice predominates. Another national dish, the odor of which permeates every gathering of Koreans, is Kimchee, a sort of pickle or kraut made primarily of the huge Daikon radish and Chinese cabbage, combined in varying degrees with garlic, leeks, peppers, dried fish, chestnuts, et al.—Heartsill Banks, Seoul, Korea.

SOYBEAN DIGEST

IN ONE PACKAGE-

A COMPLETE PRODUCTION UNIT



Here is a Blaw-Knox Chemical Process Unit including reaction vessel, auxiliary equipment, heating and cooling system and controls, and prefabricated piping, ready for assembly.

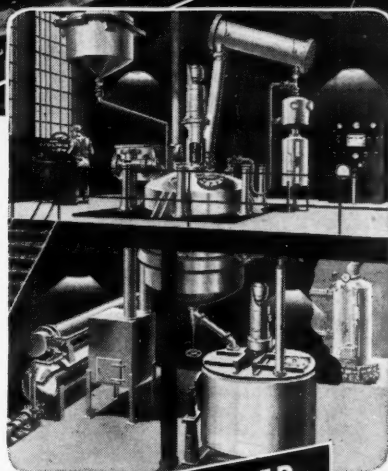
Each item is precisely engineered to perform its specific function. Simplicity of installation and economy in operation are assured.

This is one of many types of integrated plants furnished to the Process Industries.

BLAW-KNOX DIVISION OF BLAW-KNOX CO.

2030 Farmers Bank Bldg., Pittsburgh 22, Pa.

New York • Chicago • Philadelphia • Birmingham • Washington



BLAW-KNOX

IMPLEMENTS THE PROCESS INDUSTRIES



— to get acquainted with the Kelly-Duplex Line.

Since 1885 — this engineered line of mill and elevator equipment has earned a position of leadership through dependable low-cost performance.

KELLY DUPLEX
EQUIPMENT

embraces not only the units shown here — but many others such as

Shellers, Crushers and Feed Regulators, Aspirators, Scalpers, Magnetic Separators, Bag Cleaners, Truck Hoists, Elevator Buckets, Boots, Screw-Conveyor, Spouting, etc.

— All Guaranteed for your Protection.

Write for Catalog—
Our helpful suggestions
may save you time and money.



The Duplex Mill and Mfg. Co.
Springfield, Ohio



Publications

Foods

NUTRITIONAL VALUES OF MIXTURES OF POLISHED RICE, RED KIDNEY BEANS, CHICKPEAS, AND SOYBEANS. By Joseph H. Axtmayer, department of chemistry of the University of Puerto Rico, in *Journal of Public Health and Tropical Medicine*.

Polished rice and red kidney beans are the most frequently used foodstuffs in the nutritionally inadequate diets of Puerto Ricans.

Biological assay tests have shown that growth promotion in rats is not possible without supplementing this diet with protein and other factors. Aside from other deficiencies that exist in the Puerto Rican dietary, it is certain that there is a minimum consumption of good quality protein.

The object of the experiments with rats reported in this paper was to study the possible improvement of the protein quality of the rice and red kidney bean mixture by adding other readily available cheap foodstuffs such as soybeans, chickpeas and skimmed milk powder.

Rats fed a rice and kidney bean ration showed a poorer growth and consumed much less food than rats receiving a diet of rice and chickpeas, or a rice and soybean ration.

Improved growth and food consumption resulted when either chickpeas or soybeans replaced part of the kidney beans in the rice and kidney bean diet. Skimmed milk powder supplemented the proteins of the ration and promoted greater growth and better food consumption.

The author suggests that the results of the experiment can be of practical value in improving the relatively poor mixture of rice and kidney beans in common use in Puerto Rico. Skimmed milk could replace part of the water necessary in the preparation of the mixture, and chickpeas or soybeans could be substituted for part of the

kidney beans. These changes would undoubtedly improve the protein quality of the diet.

EFFECT OF SOY FLOUR AND NON-FAT DRY MILK SOLIDS IN WHITE BREAD ON THE NUTRITIONAL QUALITY OF THE PROTEIN AS MEASURED BY THREE BIOLOGICAL METHODS. By Shirley C. Carlson, F. H. Hafner and J. W. Hayward, biological research and development, Archer-Daniels-Midland Co., Minneapolis, in *Cereal Chemistry*, May 1946.

Three biological methods were used to evaluate the nutritional quality of the protein present in white water bread, 3 percent and 5 percent white soy breads, 3 percent and 6 percent white milk breads, and whole wheat water bread.

The results obtained by the three methods showed that 3 percent white soy bread and 3 percent white milk bread were equal, and that both were significantly better than white water bread.

The 5 percent white soy bread was at least equal to 6 percent white milk bread. Both were slightly superior to 3 percent white soy or 3 percent white milk breads, and significantly superior to white water bread.

The 5 percent white soy bread was equal to or better than the whole wheat water bread, as was 6 percent white milk bread, except in an ad libitum growth assay where the difference was not significant.

Storage

GRAIN STORAGE STUDIES. By Max Milner and W. F. Geddes, division of agricultural biochemistry, University of Minnesota, in *Cereal Chemistry*, in three parts, 1945-1946.

This paper represents a portion of a thesis presented to the graduate school of the Uni-

WILBUR-ELLIS COMPANY

BROKERS OF SOYBEAN OIL AND PROTEINS

Complete Domestic and Foreign Coverage

105 West Adams St., Chicago, Ill.

Telephone: CENTRAL 0494

New York

San Francisco

Los Angeles

Seattle

versity of Minnesota for the degree of Doctor of Philosophy.

I. Influence of localized heating of soybeans on interseed air movements. Changes in the interseed air composition and the temperature of soybeans stored throughout a winter season in a large open-top commercial bin were followed at numerous points in the grain bulk by the aid of a series of preinstalled small diameter pipes.

Heating, which started in a zone of high moisture, led to considerable air movement in the stored grain.

II. The effect of aeration, temperature and time on the respiration of soybeans containing excessive moisture. The seed in this investigation contained approximately 18.5 percent moisture.

Acid content of the oil extracted from soybeans at the end of respiration trials increased with aeration, with respiratory activity and with mold proliferation.

III. The relation between moisture content, mold growth and respiration of soybeans. The influence of moisture content on the respiratory characteristics of soybeans of varying commercial quality at 37.8°C was studied.

Moisture values below about 14 percent yielded very low and virtually constant respiratory rates over extended time intervals. Small increases of moisture beyond this point were accompanied by respiratory increases over a period of several days, due to mold growth.

Frost-damaged seeds showed considerably higher respiration rates than did high-quality soybeans at similar moisture levels, as well as a significantly lower critical moisture value than sound, well-matured seeds. These differences are ascribed primarily to the greater concentration and availability of nutrients for mold growth in damaged seeds.

Viability of seeds was most adversely affected by moisture content favorable to mold growth.

At moisture levels unfavorable to mold growth there were only slight chemical changes in respiring soybeans over a period of time. But drastic chemical changes occurred at moisture levels favorable to mold growth.

Insects

CONTROLLING SOYBEAN INSECTS.

By Clyde F. Smith, research associate professor of entomology, North Carolina Experiment Station, Raleigh, in *Research and Farming*.

DDT and cryolite have been used successfully in controlling insects on soybeans at the North Carolina station.

Soybeans grown in the eastern section of North Carolina are usually attacked by one or more insect pests every year. Quite commonly as much as 10 to 15 percent of the crop is ruined, and in severe cases may be completely destroyed.

Most injurious soybean pests are the velvet bean caterpillar, green clover worm, the

native bean beetle, Mexican bean beetle, corn earworm and blister beetle.

Work at the station indicates that cryolite will give satisfactory control of the leaf worms and fair control of the corn earworm. However, a dust containing 5 percent DDT gave as good or better control of the leaf worms and much better control of the corn earworm.

A count of the number of pods injured by corn earworm indicated about 1 percent of the pods injured in the plots treated with DDT. Ten percent of the pods were injured in the plots treated with cryolite and 40 percent were injured in the check or untreated plots.

There were also indications that the feeding of the worms had caused some of the pods to drop. The treated plants averaged more pods than the check plants. Plants treated with DDT averaged more pods than plants treated with cryolite.

In yield, cryolite gave an average increase of 5 bushels per acre, 3 percent DDT gave 4.5 bushels, and 5 percent DDT gave 6 bushels per acre more than the check plots. It was observed that the beans on the treated plots matured more uniformly and were of better quality.

Time of applying the insecticide to the plants is of the utmost importance. If it is applied too soon, it may be weathered off before the insects attack the plants. If not applied soon enough, the worms may already have caused considerable damage.

It is quite easy to observe the leafworms, since they do most of their feeding on the upper leaves. However, with the corn earworm it is necessary to examine the pods for injury. If the injury shows up on the small pods, it is good insurance to dust the beans immediately.

Diseases

BUD BLIGHT OF SOYBEAN CAUSED BY THE TOBACCO RING-SPOT VIRUS.

By W. B. Allington, U. S. Regional Soybean Laboratory in *Phytopathology*.

The author verifies earlier reports that tobacco ring spot virus infects and severely injures soybeans in areas of the Midwest. Symptoms vary with stage of plant growth at infection time.

Young plants show a characteristic curving of the terminal bud, bronzing of the leaves, browning of the pith, slight defoliation, poor seed set, and delayed maturity. Heavier infection is more evident at blossoming time and results in extensive loss.

The pods present a dark irregular blotched appearance and usually fall off in great numbers. Unsound seed is produced. The symptoms on other hosts are characteristic of those induced by this virus. Terminal inactivation and plant immunity tests gave further evidence of its identity.

Protein

SOYBEAN PROTEIN PRODUCTION, EFFECTS OF TEMPERATURE AND

WATER-FLAKE RATIO. By A. C. Beckel, P. A. Belter and A. K. Smith, Northern Regional Research Laboratory, Peoria, Ill., in *Industrial and Engineering Chemistry*, July 1946.

The pilot plant production of soybean protein was studied with respect to the effect of temperature and of water-flake ratio on the dispersibility of the protein and on consequent economic balance.

The effect of temperature is relatively small but the effect of the water-flake ratio, when translated into terms of plant capacity, is of primary importance economically. When the price of protein is 20 cents per

(Continued on page 33)



"This is the way one of our more recently acquired customers looked just before he contacted us. We admitted that we do supply good stout bags for Soybeans, Meal, Feed and Flour; and that our plants at New Orleans, Savannah, and Houston give good service. He was relieved, and we helped with the best solution to his problem, and thought we'd better remind you too—



"Think of Mente
When you think of Bags!"



MENTE & CO., Inc.

I. T. Rhea, Pres.

NEW ORLEANS HOUSTON

SAVANNAH

GRITS and FLAKES...

FROM THE WORLD OF SOY

The National Farm Show of farm implements has been postponed and will be consolidated with the International Livestock Exposition in 1947, according to Marcus W. Hinson, show manager. The show was originally scheduled for this November 29-December 8.

* * * *

Albert Koolhoff, Webster City, Iowa, was reelected president of the Boone Valley Cooperative Processing Association at the annual meeting in Eagle Grove, Iowa.

* * * *

Central Soya, Inc., Fort Wayne, Ind., has placed in effect a wage adjustment schedule whereby wages of its employees are increased or decreased with the cost of living as set by the consumer price index published by the U. S. Department of Labor. The schedule is paid in addition to a basic wage.

* * * *

Civilian Production Administration has granted Archer-Daniels-Midland Co. permission to build a \$250,000 plant to process soybean and linseed oils into fatty acids. The project is part of the firm's 5 million dollar expansion program.

* * * *

Thirty-Fourth Biennial Report of the Kansas State Board of Agriculture lists soybeans produced for beans by counties for 1943 and 1944. Total production in Kansas in 1944 was 3.3 million bushels as compared with an estimated 2 million bushel crop for 1946.

* * * *

A. E. Staley Mfg. Co. announces a 15 million dollar modernization and expansion program of its corn refining plant at Decatur, Ill.

* * * *

Central Soya Co., Inc., Fort Wayne, Ind., plans to erect a soybean processing plant in Memphis, Tenn., it is reported by the Memphis Realty Co.

* * * *

Harold A. Abbott, manager of Funk Bros. Seed Co.'s soybean division, Bloomington, Ill., who has been confined to his home with a heart ailment for 6 weeks, is reported improved. He plans to vacation in Arizona this winter.

* * * *

The Hubbard, Iowa, soybean mill has been bought by W. J. Hershberger and Forest Miller, both of Omaha. Lee Hershberger will continue as manager.

* * * *

"History and Uses of the Soybean" is title of an article by Edward Jerome Dies, chairman of the board of National Soybean Processors Association, in *American Feed and Grain Dealer* for September.

* * * *

W. W. Stephens has been named manager of the Glidden Co.'s vegetable oil division at Buena Park, Calif. He succeeds L. C. Barlow, who is retiring.

* * * *

A quarterly dividend of 30 cents per share, plus an extra dividend of 70 cents per share on its common stock, and the usual 93 cents per share on the \$3.75 preferred stock,

DIES RESIGNS FROM PROCESSOR GROUP

Edward J. Dies, chairman of the board of the National Soybean Processors Association, will resign as of January 1, in line with a plan of 3 years standing. He sought to be relieved in 1944, and in 1945



E. J. DIES

resigned as president. Then he agreed to serve for 1 year as chairman and Washington representative if his assistant, R. G. Houghtlin were made president, which plan was followed. He has selected for the future Washington work Attorney John D. Conner, who was with the Soy Flour Association before going to war.

Mr. Dies, who is also president of the Soy Flour Association, may retain a connection with that group, along with his other planned activities.

For 10 years Mr. Dies has been a forceful leader of the industry. His speeches, articles, and book on soybeans have accomplished much in the way of educating the public on the importance of soybeans to agriculture and to the consumer. His popularity with processors has been matched by his popularity with university authorities, research groups, and with soybean growers. During that period he has been active, also, in chemurgy.

His purpose in withdrawing, directors said, is to be relieved of daily routine and have flexibility of time for other activities.

Officers of the American Soybean Association will miss his enthusiastic cooperation on problems of mutual interest.

ZIMMERMAN ALDERSON CARR COMPANY

BROKERS IN VEGETABLE OILS

Intelligent and Honest Brokerage Service Since 1908

O. B. Huffaker G. L. Eldred G. D. Huffaker

105 W. Adams St., Chicago 3, Ill.

L. D. 29 Randolph 2037 L. D. 30

NEW YORK

MEMPHIS

DALLAS

NOTHING BUT THE BEST
IS GOOD ENOUGH FOR



Bemis service to the soybean industry covers every phase of packaging, including supplying bags and bag closing material and designing brands. • Bemis manufactures all types of bags for soybean products...and our policy is to furnish you with only the best.

The Bemis factories across the country offer you a convenient, reliable source of supply. Call your Bemis representative.

BEMIS BRO. BAG CO.

Baltimore • Boise • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Denver • Detroit
East Pepperell • Houston • Indianapolis • Kansas City • Los Angeles • Louisville • Memphis • Minneapolis
Mobile • New Orleans • New York City • Norfolk • Oklahoma City
Omaha • Orlando • Peoria

St. Helens, Ore. • St. Louis • Salina
Salt Lake City • San Francisco
Seattle • Wichita • Wilmington, Calif.



DECEMBER, 1946

KALO INOCULATION

**You Can SAVE
as Much as
\$10
per Acre**

by inoculating your Soybean Seed every year. Uninoculated Soybeans may produce a good crop on good land, but they'll take the valuable nitrogen from the soil, at a cost to you of at least \$10 per acre per crop. Take this nitrogen from the air and you'll actually save this \$10.

**KALO INOCULATION Is Tops
in Quality . . . Low in Cost**

Kalo Inoculants contain superior strains of bacteria . . . carefully selected for their nitrogen-fixing ability. They've been proven in over 500 competitive tests . . . yet the price is low. You can save and profit with KALO INOCULATION.

UNI-CULTURE
3 Cultures in 1 Can for
all clovers, alfalfa and
soybeans.

KALO INOCULANT CO.
QUINCY ILLINOIS

has been voted by the board of directors of A. E. Staley Mfg. Co., Decatur, Ill.

* * * *

John P. Widlar, a member of the Chicago sales staff of Chase Bag Co. for the past 6 years, has been transferred to the Omaha district of the firm's Kansas City branch. He will serve as sales representative in the Omaha area.

* * * *

Plant facilities of Ohio Valley Soy Bean Cooperative at Henderson, Ky., have been expanded with the addition of a 125,000 bushel Quonset type warehouse. A new boiler also has been added to the plant.

* * * *

Samples of new products from Borden's plant in Waterloo, Iowa, were exhibited at the recent national candy and confectioners' convention in Chicago.

* * * *

Soybean oil of the type heretofore used only for salads and cooking oil is now being bought by oil-starved manufacturers of linoleum, in place of linseed oil, now unobtainable, reports RETAIL FOOD MANUFACTURER.

* * * *

Clifton's Cafeterias, Los Angeles, plans to offer its patrons a drink which is 95 percent whole milk, 5 percent soya milk, with vitamin C enrichment, to be called "Mil C." Clifton's objects, however, to labeling the product "imitation milk" as required by California law.

* * * *

A. C. Carpenter, 77, first vice president of the Bemis Bro. Bag Co., died in St. Louis November 5. Mr. Carpenter had been associated with the Bemis Co. for 50 years and had come up from the ranks.

* * * *

Phoenix Oil Mill, Ridgely, Tenn., began its first season's crush on soybeans the middle of November. The firm will crush cottonseed later in the season. There are ample storage facilities for both cottonseed and soybeans. Wynn Smith is owner.

* * * *

A one coat decorative sand plaster wall finish, known as Plastic Plaster, that contains a soybean derivative, is now offered by Sicca Soya Sales Co., Peoria, Ill. The product is plaster and paint in one application.

* * * *

An Ohio map showing estimated soybean production by counties for 1946 and listing elevators handling soybeans on the Baltimore and Ohio railroad has been issued by the agricultural department of the road.

* * * *

A second article on flavor reversion in soybean oil was carried in November *Oil and Soap*. Its authors are Calvin Golumbic, C. J. Martin and B. F. Daubert of the University of Pittsburgh.

* * * *

Herbert V. Nootbaar, vice president and general manager of the Pacific coast division of Ralston Purina Co., Los Angeles, Calif., has announced the formation of a new feed and fertilizer jobbing and brokerage business called H. V. Nootbaar & Co., and his resignation from the Ralston-Purina Co.

**Used
BURLAP & COTTON
Bags**

WATERPROOF TARPAULINS

MAX KATZ

BAG CO.

INDIANAPOLIS, IND.

WHIP TOPPING BY PLANE TO ALASKA



Above you see Air Stewardess Mildred Pierce cutting a cake frosted with Whip Topping, a soy product.

The cake is pictured atop other items taken on the first weekly air-freight shipment of fresh and frozen foods from Los Angeles to Alaska recently initiated by American Air Lines.

The Whip Topping used on the cake is a frozen soy cream for whipping and an ingredient in desserts and salads. It was introduced by Rich Products Corp., Buffalo, N. Y.

Over \$60,000 has been spent by the firm in erecting a modern plant and purchasing new equipment to handle the consumer demand for Whip Topping, distribution of which is nationwide.

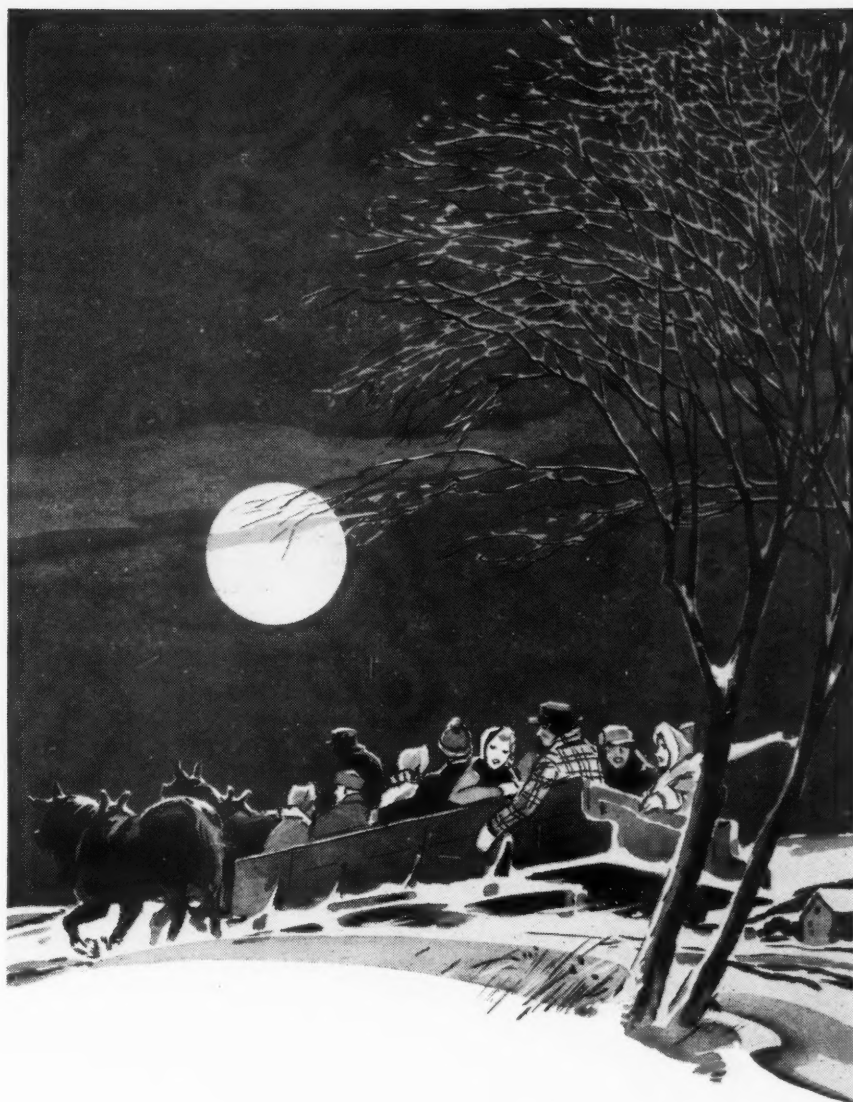
Whip Topping is a pure frozen soy cream containing soy protein, vegetable fats, carbohydrates, salt, flavoring and coloring. The cream whips to three times its bulk in less than a minute. It is a perfect topping for desserts, cakes, gelatine and salads.

"We are producing approximately 1 million half-pints a month," said Robert E. Rich, president of Rich Products Corp., and also president of Wilber Farms Dairy of Buffalo, "but we expect we will have to step up production further immediately. Our plant is working 24 hours a day, 7 days a week."

— s b d —

Losses on soybean combining now range between 5 and 10 percent compared with two and three times that amount 25 years ago, when soybeans were bound and threshed from shocks like wheat and oats, reports A. L. Young, agricultural engineer, University of Illinois College of Agriculture, Urbana.

DECEMBER, 1946



Here's wishing you
a Good Old Fashioned
Merry Christmas and a
Happy New Year and
Bountiful Blessings
throughout 1947

Prater Processing Equipment

PRATER PULVERIZER COMPANY
1515 South 55th Court • Chicago 50, Ill.

WASHINGTON Digest

Beans and Parity

The steady rise in the parity price index, which reflects major farm production and living costs (except labor) has for the first time on November 15 brought the parity price for soybeans up to the \$2.04 a bushel price support level.

The parity index rose 10 points from mid-October to a new high of 212 percent of 1909-14 base period on November 15, and is expected to climb a little more before turning down.

Parity for soybeans is calculated by multiplying the monthly parity index (which goes up and down as costs fluctuate) by the derived (or comparable) base price of 96 cents a bushel.

Many think that the base price for soybeans is too low. It compares with a base period price for corn of .642 cents a bushel, and for oats of .399 cents a bushel.

When world export supplies of fats and oils return to prewar levels (Bureau of Agricultural Economics says this won't come before 1948 at the earliest) the parity level for soybeans will become of dollars-and-cents importance to producers.

The postwar price guarantees pledged in the "Steagall Amendment" tie the level of farm price supports directly to parity. Under the law, price supports must reflect a minimum of 90 percent of parity to the producers of soybeans — within the limits of funds to finance price support programs.

Unless the President, by formal proclamation, declares World War II hostilities officially ended before January 1, 1947 (and this is improbable) the postwar farm price

support period will extend to January 1, 1950.

Republican congressional farm leaders have indicated they would entertain suggestions for modernization of parity, if the major farm organizations press for it.

National Grange and National Farmers Union have asked for a change in the parity formula. Grange wants adoption of its own parity plan; Farmers Union asks for inclusion of farm labor costs.

American Farm Bureau Federation officials have indicated they want to keep the present formula until the "Steagall" period runs out, then to consider adjustments.

Imports of Copra

Department of Agriculture expects to hold onto its control of Philippine copra exports under the copra agreement, but it is willing to raise the price to the Philippines more in line with United States prices since ceilings were removed.

Under the copra agreement signed last August, the Philippines agreed to give the U. S. control over its exportable surplus for the year ending next July. The agreed price, based on U. S. price ceilings, was \$103.50 a long ton.

In recent weeks, the Philippine government has asked for termination of the agreement.

USDA officials in charge of the copra program say that price is not an issue; that the U. S. doesn't expect to hold the Philippines to an outdated price arrangement. The same applies to the agreement signed with the Dutch for East Indies copra.

But Secretary of Agriculture Anderson

By PORTER M. HEDGE

Washington Correspondent for
The Soybean Digest

does want to keep U. S. control of copra exports for duration of the agreement, either in the form of the present arrangement, or its equivalent.

Philippine copra exports are estimated at approximately 500,000 short tons for this calendar year. Prewar (1935-39) exports averaged 623,300 short tons a year, about a third of world exports.

About 55 percent of Philippine shipments this year — roughly 400 million pounds of coconut oil — is allocated to the United States. In addition, the U. S. has imported about 32 million pounds of coconut oil and copra (in terms of oil) from non-Philippine sources.

Philippine copra exports next year are estimated at between 540,000 and 780,000 tons, or from 45,000 to 65,000 tons a month.

U. S. copra crushings next year are expected to approach 500,000 short tons. The peak for recent years was 275,000 short tons in 1940.

The Philippine Trade Act discourages island production of coconut oil for export to the United States.

For the next 8 years, through 1954, the duty free quota for Philippine coconut oil imported into the U. S. will be 200,000 long tons a year. Starting in 1955, the duty free quota will be lowered 10,000 long tons each year until all imports are on a duty paid basis. There is no duty on copra.

The Dutch so far have been getting approximately 30,000 tons of copra a month out of the East Indies.

Editor's Note: As the Digest goes to press we received word that the USDA has cancelled its copra agreement with the Philippines providing for U. S. control over export supplies until next July.

However, Secretary Anderson said in announcing the end of the agreement, "I feel fully assured that in the absence of a formal agreement the U. S. and Philippine governments will continue full cooperation to see that American requirements for copra imports are met and that necessary world allocations are continued."

Supply of Feeds

The Bureau of Agricultural Economics estimates that the supply of by-product feeds for livestock during the feeding season starting in October will be about 6 percent greater than a year ago.

Most of the increase is due to a prospective greater supply of wheat millfeeds. Supply of oilseed cake and meal will total an estimated 5.6 million tons, 174,000 tons less



RECONDITIONED BAGS

- CAREFULLY SELECTED
- THOROUGHLY CLEANED
- EXPERTLY RECONDITIONED

BURLAP AND COTTON BAGS

for every purpose

WRITE • WIRE • PHONE
Sell Us Your Surplus

A RECOGNIZED OUTLET FOR OVER 20 YEARS

ARCO Bag Co. 2423 W. 14th STREET
CHICAGO 8, ILLINOIS
CANal 3821

than in 1945-46. Here are the estimates by type of feed in thousands of tons:

Feed	1938-42 Average	1945	1946 Esti.
Mill by-products ...	6,933	7,871	9,050
Oilseed cake & meal	4,443	5,799	5,625
Animal proteins ...	2,946	2,411	2,425
Other by-product feeds	1,920	1,600	1,600
Total	16,242	17,681	18,700

In the final 1947 soybean goals recommendations to states, Illinois is asked to plant 50,000 fewer acres than originally proposed—down from 3,750,000 acres to 3,700,000 acres.

The change reduces the national production goal from the original 212,210,000 bushels to 211,135,000 bushels.

PUBLICATIONS

(Continued from page 27)

pound, the proper water-flake ratio for maximum profit is about 11 to 1 with slight dependence on the price of meal. But when the price is 10 cents per pound, the water-flake ratio is about 20 to 1 with increased meal price influence.

In large-scale production such a shift in proportions is economically important.

Feeding

PRESENCE OF A GROWTH INHIBIT- ING SUBSTANCE IN RAW SOYBEANS.

By A. A. Klose, Barbara Hill and H. V. Fevold, Western Regional Research Laboratory, Albany, Calif., in *Soc. Expt. Biological and Medical Proceedings*.

A substance which inhibits the growth-promoting properties of proteins in rats is present in raw soybeans.

The substance is non-dialyzable, precipitated by salt, and inactivated by heat. It appears, therefore, to be a non-protein, which has been shown to be concentrated in the acid-soluble (pH-4.2) fraction of the soybean protein.

Market Street

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 5c per word per issue.
Minimum insertion \$1.00.

REPRESENTATIVE soybean oil mills. Will positively give you best representation for soy oil and meal in South and Southwest Texas, also South Louisiana; exclusive representations solicited also. A. E. Burgess, 401-03 United Gas Bldg., Houston, Texas.

NEW STEEL TANKS STOCK SHIPMENT

80— 4,200 Gal. Cap. 9'2"x 8' Vertical
5— 21,000 Gal. Cap. 21'6"x 8' Vertical
15— 42,000 Gal. Cap. 21'6"x16' Vertical
30— 42,000 Gal. Cap. 29'8"x 8' Vertical
10—126,000 Gal. Cap. 29'8"x24' Vertical
L. M. STANHOPE, ROSEMONT, PENNA.

SOYBEAN OIL TRADE BY N. Y. EXCHANGE

The New York Produce Exchange has announced the inaugurating of trading in bleachable refined soybean oil, effective November 25. Trading hours are from 10 a. m. to 3:30 p. m. weekdays, and from 10 a. m. to 11:30 a. m. Saturdays.

The contract unit will be 60,000 pounds. Trading will be for 12 months.

"To the tremendous growth of soybean production in the United States during the past 10 years, and to the vital part soybean oil has played in the edible oil field during the momentous war years," the exchange said, "the New York Pro-

duce Exchange, heeding the manifest need of a hedging market to assist those in the processing and refining field, adopted the present contract."

— s b d —

FRANCE SETS PRICES

France has established net prices to producers for 1946 domestic oilseed crops at 2,700 francs per quintal (10.30 cents per pound) for rapeseed, sunflower seed, and flaxseed and 3,000 francs (11.44 cents) for black mustard, soybeans, and poppy seed, reports *Foreign Crops and Markets*. The 1947 prices have also been set for rapeseed, sunflower seed, and flaxseed at 2.7 times and for other oilseeds at three times the wheat price.

Swift's Soybean Oil Meal



Swift's Soybean Oil Meal makes all livestock and poultry say "Wow! What good feed!" And so feed manufacturers, feed mixers and feed dealers prefer it in their mixed feeds. You'll find it will help build your business by bringing in new customers and repeat orders from old ones. Remember (1) it's a good source of high-quality proteins and other important nutrients. (2) It adds taste-appeal to all mixed feeds. (3) It gives the right balance to your formulas. (4) It is always uniform in quality and gives dependable results.

When buying Soybean Oil Meal from...or selling soybeans to...Swift & Company, you can always rely on Swift's prompt, friendly service.

SWIFT & COMPANY

Mills at: Cairo, Ill. Fostoria, Ohio Champaign, Ill.
Des Moines, Iowa Frankfort, Ind. Blytheville, Ark.

1946 SOYBEAN YIELD IS SECOND GREATEST

Soybean prospects improved materially during October, reports the USDA crop reporting board.

The November 1 indicated production of 191,912,000 bushels is slightly above the 191,722,000 bushels produced last year and is exceeded only by the 193 million bushel production of 1943. A yield of 20.3 bushels per acre is now indicated, well above the 17.6 bushels last year and the 10-year average of 18.0 bushels per acre.

The quality of the crop is exceptionally good. With most of the acreage maturing under favorable conditions, moisture content of the beans is very low.

Yields have turned out better than expected in Illinois and in the West North Central states. Drought earlier in the season in northern Indiana, northern Ohio,

southern Michigan and southern Wisconsin caused more damage than previously indicated and final yields were below expectations in those states. Indiana still has a yield well above average although below the high yields of 1945. The Ohio yield is below average.

Only a small proportion of the crop still remained to be combined on November 1. Yields reported at harvest time were better than expected earlier in the season. Frosts caused practically no damage. Even the late planted acreage had ample time to reach maturity. Minnesota, Iowa and Missouri indicate improved prospects with record yields. The South Central states showed no change in prospects from October, except Arkansas where yield prospects rose to the highest ever recorded for that state.

Canada's 1946 soybean production, estimated at 1,063,000 bushels from 54,500 acres, is a record crop for that country,

exceeding the 1945 output by more than 200,000 bushels.

Average per acre yield of soybeans for Ontario is reported at 19 bushels by the Ontario Department of Agriculture. This compared with a yield of 18.3 bushels for 1945.

SOYBEANS FOR BEANS

State	Yield per acre		Production	
	1945	1946 Prelim.	1945	1946 Prelim.
	Bushels		Thousand bu.	
Ohio ..	17.5	18.0	20,072	17,118
Indiana ..	19.5	19.0	27,924	24,510
Illinois ..	19.5	23.5	74,100	74,119
Mich. ..	16.0	13.0	1,952	1,376
Wis.	15.5	12.0	636	336
Minn.	15.0	18.0	6,825	10,512
Iowa ..	18.0	22.5	34,848	35,145
Mo.	13.0	19.0	9,490	12,331
Kans.	10.0	10.5	2,740	2,194
Va.	16.0	16.0	1,360	1,280
N. Car.	12.5	13.0	2,700	2,600
Ky.	14.0	16.0	854	976
Tenn.	14.0	18.0	966	1,440
Miss.	13.0	13.0	962	832
Ark.	16.0	18.0	3,344	4,158
Others ..	13.3	13.1	2,949	2,983
U. S.	17.6	20.3	191,722	191,912

— s b d —

THE GERMANS MADE BUTTER FROM COAL

"Germany will make guns instead of butter," the Nazis boasted. But German technological ingenuity found a way to get the guns and still eat butter, states *Pathfinder* news magazine.

The way was by making synthetic butter from coal.

It was done in a factory at Witten, a town in the industrial and coal mining Ruhr district. "I doubt if anyone would guess it was synthetic butter," said a British occupation official. "It looks and tastes like the real thing—and it keeps indefinitely without refrigeration."

Dr. Karl Heinz Imhausen, owner of the factory which produced 600 tons of synthetic butter a month, said it cost only half as much as natural butter. Here's how he described the process:

The coal is made into coke; the coke into gas; the gas into paraffin. Then, by a blowing operation (the most difficult part of the process) 80 tons of fats can be drawn from 100 tons of paraffin. Some of these fats are edible, some are not.

The edible fats are diluted with 20 percent water; mixed with carrot extract for color and flavoring; injected with a substance named diacetyl to give the smell of butter.

This mixture is whipped up in a machine, and comes out sausage-shaped, about 8 inches in diameter. Another machine molds the sausages in loaves of butter.

The fats that aren't edible can be made into soap, or into by-products that include a basic material for plastics, a softening material for synthetic rubber, an ingredient for varnish, or a form of alcohol.

— s b d —

It is being predicted that the present high market price for flax may result in a seed shortage for 1947 plantings, since farmers have been tempted to sell even their seed stocks at the present high market.

Nice Package!

Flour bag to sun suit is the short story behind this eye-peeling package.

Women are buying many products—sugar, salt, seed, feed, flour, etc., in colorful Ken-Print Bags, because they are re-usable in making everything from dresses to draperies.

If your product is gathering cobwebs on retailers' shelves, let Percy Kent offer suggestions that will make them move—but fast!



**PERCY KENT
BAG CO. INC.**

BUFFALO KANSAS CITY NEW YORK

PAINT MAY BE MORE PLENTIFUL IN 1947

You may be able to put a new coat of paint on your old house late in 1947, when paints should be more plentiful.

This was the consensus of the Glidden Co.'s principal technical experts, who were in Cleveland recently for a research and development conference.

These men, who include research and technical directors of the vegetable oil, chemical and pigment, naval stores and paint and varnish divisions of the highly diversified Cleveland company, attribute the lack of sufficient exterior house paints to a continued world-wide shortage of both edible and inedible vegetable oils, of white pigments such as lead and titanium dioxide and, partly, to the shortage of containers.

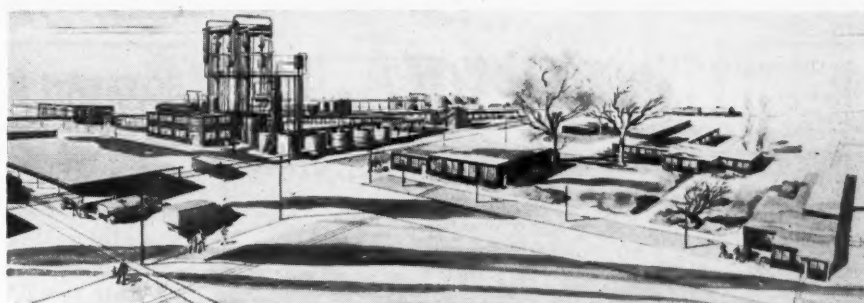
Pent-up demand stemming from the war years, new residential construction and industrial reconversion created today's tremendous demand.

— s b d —

GROWS SOYBEANS AND PEAS THE SAME YEAR

Generally, it is not advantageous to plant two crops on the same land in 1 year, especially in non-irrigated areas. In De Kalb County, Ill., however, a

New General Mills Plant



Architect's drawing of the new organic chemical plant of General Mills, Inc., at Kankakee, Ill. The facilities are designed for the production of fatty acids and derivatives used in the protective coating and other industrial fields. Operations are in charge of Arthur P. Berry, manager of the chemical division's fatty acid operations.

field of soybeans was planted after a crop of early peas had been harvested, reports H. J. Gramlich, agricultural agent of the Chicago and Northwestern Railway.

The beans fully matured and gave prospect of making 25 bushels per acre, says Gramlich. The peas produced over a ton of shelled peas per acre, so the land gave a good account of itself.

The agent points out that planting a second crop is usually a gamble. Considerable summer and early fall moisture and a late frost are necessary. And two crops from the same land in 1 year sap a good deal of the soil's fertility.

AUSTRALIAN MEETING

The National Soybean Growers and Processors Association of Australia is holding a field day at Armidale, N. S. W., the latter part of January, reports Don Shand, honorary organizer of the soybean project at Armidale.

The American consulate has been invited to send representatives to the meeting, says Mr. Shand.

He reports that large acreages of Lincoln, Dunfield and Richland soybeans are being planted in the Armidale area.

WOODSON - TENENT LABORATORIES

P. F. WOODSON

E. H. TENENT

Analytical Chemists

SOYBEANS - CAKE - MEALS - OILS

Main Offices and Laboratories

265 South Front Street

Memphis, Tennessee

Branches: Cairo, Illinois, Blytheville, Arkansas and Little Rock, Arkansas

"OVER 500 MILLION DOLLARS WORTH OF PRODUCTS ANALYZED SINCE 1935"

Official chemists for National Soybean Processors Association

ROESLING, MONROE & CO.

CARL H. SMITH — GEO. K. DAHLIN — LARRY K. DROOM

327 South La Salle Street — Phone Harrison 2382 — Chicago 4, Illinois

BROKERS

CRUDE & REFINED VEGETABLE OILS

BIDS and OFFERS SOLICITED

Wire, Phone or Write

read what users say!

- Granville, Ill.—Speeds up work. Saves 4 to 6 men.—B. E. Moews.
- Dassel, Minn.—Very good work—no trouble.—Meeker County Seed Co.
- Versailles, Ohio.—Greater production. Excellent performance.—J. K. Long.
- Lima, Ohio.—Great time saver. Neater package.—The Ackerman Co.
- Honesdale, Pa.—Suspended from the ceiling, it uses no floor space.—Cooperative G. L. F. Service, Inc.

Ask for latest information on this and other modern Union Special Bag Closing Machines. UNION SPECIAL MACHINE CO., 476 North Franklin St., Chicago 10, Illinois.

Union Special
SUSPENDED HEAD
Bag Closing Machines

H. W. DEVORE & CO.

Since 1876

TOLEDO 4, OHIO

GRAIN-SOYBEANS

and

GENERAL BROKERS

PROCESSOR REPRESENTATIVES

MEMBERS

TOLEDO-CHICAGO EXCHANGES

TOLEDO CONSIGNMENTS

CHICAGO FUTURES

Phones: L.D. 56

Adams 9615

In The MARKETS

SOYBEAN AND MEAL MARKETS LEVEL; OIL GOES HIGHER

Both soybean and soybean oil meal markets continued to level off in November after reaching October high points of \$3.51 for cash No. 2 beans, and \$100 for bulk meal, Decatur basis.

By the middle of November the movement in soybeans was coming to an end, with relatively few spot sales reported in Chicago the latter part of the month. The lower price for beans reflected a slower market for meal.

Processors had little oil meal to offer for November-December shipments, and a relatively small amount of trading was reported for later shipment, as processors and buyers were not getting together.

The pressure of large offerings of new crop corn was a depressing factor in the demand for mixed feeds. It was reported that the slow demand caused some feed manufacturers to sell large quantities of soybean oil meal previously purchased for use in mixed feeds. There was some pickup in demand with firmer tone for January-forward shipments of meal reported the last of the month.

Prompt shipments of bulk oil meal, Decatur basis were being quoted at \$78 to \$80; January to March shipments at \$78 and May-September shipments at \$69 to \$70.

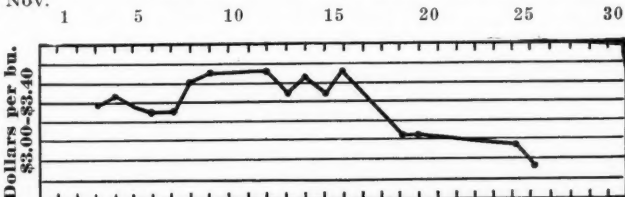
Both soybean and linseed meals are priced relatively lower than other oilseed meals.

The oil market was more active, closing at 24 to 25 cents, from 2 to 3 cents higher than a month earlier. The market was consistently strong the latter part of November. Traders anticipated a moderately active oil market right through the year.

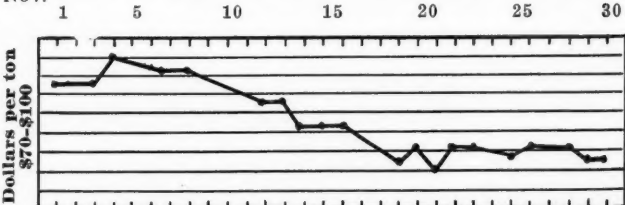
The first postwar futures market for soybean oil was established on the New York Produce Exchange November 25. Only one sale was reported the first week, however. It was a contract for January oil at 25 cents a pound.

Lack of interest in the futures market was attributed in part to the shortage of available soybean oil in the Midwest. Dealers said also that the price spread between the cash and futures markets was not large enough to attract hedges.

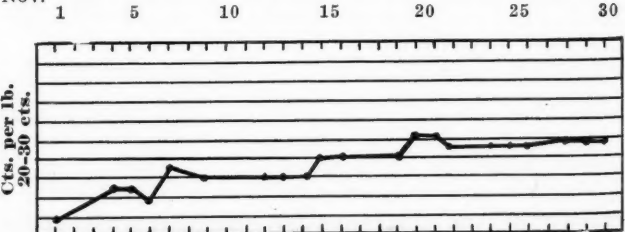
CASH NO. 2 SOYBEANS Chicago Market, November 1946



SOYBEAN OIL MEAL, Bulk, Decatur Basis, November 1946



SOYBEAN OIL, Crude, Tankers, f.o.b., Decatur, November, 1946



SOYBEAN DIGEST

• **SOYBEAN SUPPLIES FOR 1946-47 SLIGHTLY BELOW LAST SEASON.** Supplies of soybeans for 1946-47 are expected to be about 3 million bushels less than last season as a result of a much smaller carryover and a crop only slightly larger. Disappearance of soybeans during the 1945-46 season was about 2 million bushels under the record of the previous season. With the removal of price control soybean prices advanced sharply during the first 10 days of November and averaged about a dollar a bushel above the ceiling levels.

Carryover stocks of soybeans on October 1 were the smallest in the 5 years of record and amounted to only 4.3 million bushels. This is only 56 percent as large as the 7.7 million bushels a year ago and 30 percent as large as the 14.3 million bushels on October 1, 1944. Based on current estimates of production and the carryover, supplies of soybeans for 1946-47 amount to 196 million bushels compared with 199 million for 1945-46 and 205 million for 1944-45.

As a result of the urgent demand for oil and meal, disappearance of soybeans in 1945-46 was the second largest on record and amounted to 195 million bushels. This compares with 197 million in 1944-45 and 191 million bushels in 1943-44. Crushings of soybeans for oil last season were at record levels and amounted to almost 159 million bushels according to reports to the Bureau of the Census. This is 5 million bushels more than in 1944-45 and 16 million bushels above 1934-44. The use of soybeans for flour and grits was also a record high amounting to over 9 million bushels with 8 million used for low fat and 1 million bushels for full fat products. This compares with a little less than 3 million bushels used in 1944-45 and 6 million in 1943-44. Exports of soybeans were heavy the first half of the season amounting to 2.4 million bushels with less than .4 million bushels exported in the last half of the season. Exports in 1944-45 totaled 5 million bushels while in the two previous seasons exports were somewhat under 1 million bushels.

Soybean prices have advanced one dollar per bushel above ceiling levels influenced by worldwide shortages of oil, urgent demand for feed and the removal of price regulations. For the first 10 days in November No. 2 yellow soybeans averaged over \$3.25 per bushel at Chicago. This compares with \$2.87 this October; \$2.11 a year ago and \$1.27 the 10-year (1935-44) October average. Effective October 1 ceiling prices for soybeans were increased 15 cents per bushel, to \$2.25 for U. S. No. 2 green and yellow soybeans and on October 17 were removed.

To meet the shortage of oil a 19 percent increase in acreage of soybeans has been suggested for 1947. The goal for next year is 11,300,000 acres of soybeans for beans which compares with 9,477,000 acres estimated for harvest in 1946 and 4,121,000 acres the 1937-41 average harvested acreage. The 1946 crop is currently supported at \$2.04 per bushel for No. 2 yellow or better.

The quality of the 1946 crop is good but below the excellent crops of 1944 and 1945. Based on inspected receipts during October, 77 percent graded No. 2 or better compared with 93

BLANTON MILL

— Incorporated —

OPERATED BY

The Blanton Company

Refiners of Vegetable Oil

MANUFACTURERS OF VEGETABLE OIL
FOOD PRODUCTS

Creamo Margarine
Salad Dressings

Shortening
Salad Oils

Blanco

SOYA BEAN OIL MEAL

WE SOLICIT OFFERINGS OF SOYA BEANS

THE BLANTON COMPANY

3328 North Wharf

ST. LOUIS 7, MO.

MARIANNA SALES COMPANY

MEMPHIS 1, TENN.

Dealers in

Soybean and Cottonseed Products

Brokers in

Soybean and Cottonseed Meal Futures

Members

Memphis Merchants Exchange

American Feed Manufacturers Association

Tel. 55707

L. D. 364

Make Patching & Repair Work Easy With

TEHR-GREEZE

FABRIC
CEMENT

WHITE — Repairs all types of cloth, canvas and leather goods. A tough, versatile adhesive with thousands of uses in home, repair shop and farm.



ALL-PURPOSE — Cements wood to wood, glass to glass, metal to metal, glass to metal and many other combinations. A clear transparent cement.

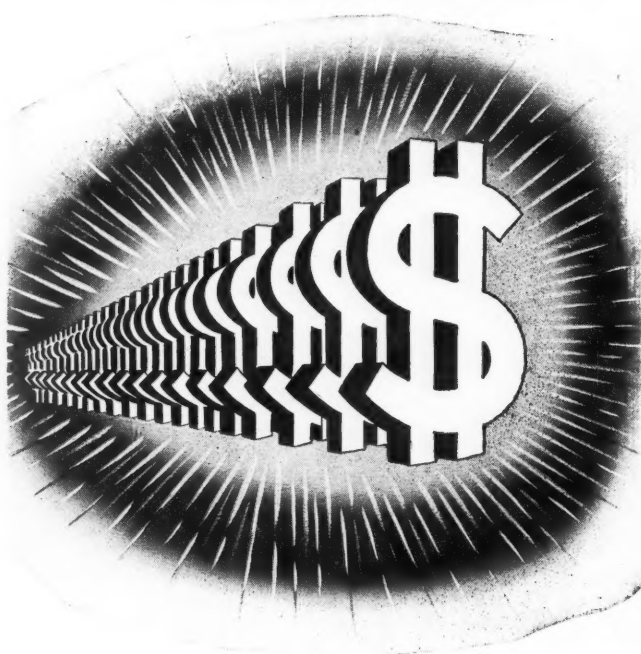
Write for Trade Prices

VAL-A Company

700 W. Root St.
CHICAGO 9, ILL.



INVENTORIES OF SOY BEANS, GRAIN, SEEDS and FEEDSTUFFS COLLATERALIZED FOR COMMERCIAL LOANS!



Processors and Dealers **EXPAND** your WORKING CAPITAL through our FIELD WAREHOUSING SERVICE

If you are confronted with a heavy inventory of Soy beans and oil which represents a substantial portion of your current assets,—you may have your inventory placed in a collateral position, right on your business location,—s-p-e-e-d-i-l-y and economically through our service,—enabling you to obtain an additional Loan from your Bank or Lending Agent.



WRITE TO OUR NEAREST OFFICE

Without obligation and in strict confidence. Learn how we establish legal warehousing operations on the spot and issue valid Warehouse Receipts, which are acceptable as preferred loan collateral.

ST. LOUIS TERMINAL WAREHOUSE CO.

SERVING INDUSTRY OVER TWENTY YEARS

ST. LOUIS 2, MO. • CHICAGO 3, ILL. • CINCINNATI 2, OHIO
826 Clark First Natl. Bank Bldg. Chamber of Commerce Bldg.
DALLAS 1, TEXAS • KANSAS CITY 6, MO. • MEMPHIS 3, TENN.
Construction Bldg. S. M. A. Bldg. Farnsworth Bldg.

percent in 1945 and 87 percent in 1944. Inspected receipts of soybeans in October totaled 32,278 cars this year compared with 29,377 for the same month last year and 32,163 cars two years ago.

Stocks 1/ of Soybeans in Interior Mills, Elevators, and Warehouses, October 1, 1946, by States, With Comparisons

State	Oct 1, 1945	July 1, 1946	Oct. 1, 1946	State	Oct 1, 1945	July 1, 1946	Oct. 1, 1946
	Thousand bushels				Thousand bushels		
Ohio ...	18	320	30	Kans. ...	4	19	4
Ind.	71	290	39	Va.	1	13	2
Ill.	105	1,443	43	N. C. ...	1	5	1
Mich. ...	4	15	3	Miss. ...	1	11	3
Minn. ...	43	43	15	Ark. ...	0	7	1
Iowa ...	99	1,158	62	Others .	88	130	61
Mo.	12	68	4				
Nebr. ...	0	4	0	U. S.	447	3,526	268

1/ Excludes stocks in processing plants enumerated by the Bureau of the Census and commercial stocks at terminals reported by the Grain Branch, Production and Marketing Administration.

Stocks of Soybeans, October 1, 1946, With Comparisons

Position	Oct. 1, 1944	Oct. 1, 1945	July 1, 1946	Oct. 1, 1946
	(1,000 bu.)			
On Farms	4,765	2,931	6,780	2,127
Int. M. E. & Whses. 1/	1,128	447	3,526	268
Processing Plants ...	5,214	3,548	22,753	1,793
Terminals	1,323	815	3,424	157
Steel & Wooden Bins	1,876	0	0	0
Total All Positions ..	14,306	7,741	36,483	4,345

• COMMERCIAL SOYBEAN STOCKS. Production and Marketing Administration's commercial grain stock reports for November.

U. S. Soybeans in Store and Afloat at Domestic Markets

	Nov. 5	Nov. 12	Nov. 19	Nov. 26	Dec. 3
	(1,000 bu.)				
Atlantic Coast	57	138	263	459	638
Gulf Coast	83	162	251	277	437
Northwestern and Upper Lake	969	1,845	2,613	3,012	3,106
Lower Lake	6,867	8,019	8,101	8,708	8,756
Eastern Central ...	3,852	5,244	5,810	5,502	6,982
West Central Southwestern & Western.	2,861	3,375	3,044	3,892	3,957
Total current week.	14,689	18,783	20,082	21,850	23,876
Total Year ago	13,043	20,660	240,145	25,400	25,049

• STANDARD SHORTENING SHIPMENTS. By members of Institute of Shortening Mfgs., in pounds.

November 9	10,630,592
November 16	10,494,522
November 23	10,650,401
November 30	9,225,236

Government Orders

• CANADA ADVANCES SOYBEAN PRICES. The minimum price for No. 1 and No. 2 Canada grade soybeans was advanced from \$2.15 to \$2.40 per bushel, effective Nov. 4, 1946. Increases on other grades are also 25 cents per bushel with the new prices ranging from \$2.12 to \$2.37 depending upon the moisture content. These prices apply to soybeans in bulk at Halifax, Quebec, Montreal, Toronto, Winnipeg, Lethbridge, or Vancouver. Deliveries elsewhere are at the maximum prices less the normal cost of transporting soybeans in carload lots from such point to the nearest named city.

The POPE TESTING LABORATORIES

CONSULTING, ANALYTICAL CHEMISTS
and TESTING ENGINEERS

Official Chemists:

NATIONAL SOYBEAN PROCESSORS ASS'N.

2618½ Main St., Dallas 1, Texas P. O. Box 903